Contents

SPEED MATHS

Speed Maths is a method of solving mathematical problems quickly and accurately using mental calculation techniques, shortcuts, and tricks. It involves the use of techniques such as simplification, approximation, estimation, and pattern recognition to solve numerical problems in a time-

efficient manner. Speed Maths is commonly used in competitive exams and is an essential skill for students and professionals who deal with numbers regularly. The objective of Speed Maths is to solve mathematical problems in the shortest possible time while maintaining accuracy.

IMPORTANT FORMULAS USED IN SPEED MATHS

There are several important formulas used in Speed Maths to quickly solve mathematical problems. Some of the most commonly used formulas are:

1. Squaring numbers ending in 5: (a5)^2 = (a x (a+1))25 For example, 35^2 = 3 x 4 = 12 and 25, so the answer is 1225.
2. Multiplying numbers close to 100: (100 - a) x (100 - b) = 10000 - (a+b) x 100 + ab For example, 98 x 96 = (100-2) x (100-4) = 10000 - 6 x 100 + 8 x 4 = 9408.
3. Divisibility by 2, 3, 4, 5, 6, 8, 9, 10, 11: A number is divisible by 2 if its last digit is even. A number is divisible by 3 if the sum of its digits is divisible by 3. A number is divisible by 4 if the last two digits are divisible by 4. A number is divisible by 5 if its last digit is 0 or 5. A number is divisible by 6 if it is divisible by both 2 and 3. A number is divisible by 8 if the last three digits are divisible by 8. A number is divisible by 9 if the sum of its digits is divisible by 9. A number is divisible by 10 if its last digit is 0. A number is divisible by 11 if the difference between the sum of the digits at even places and the sum of the digits at odd places is divisible by 11.
4. Percentage: To find x% of a number y, multiply y by x/100. For example, 25% of 80 = 80 x 25/100 = 20.
5. Profit and loss: Profit% = (Profit/Cost Price) x 100, Loss% = (Loss/Cost Price) x 100, Selling Price = Cost Price + Profit, Selling Price = Cost Price - Loss For example, if the cost price of an item is $50, and it is sold for $60, the profit percentage is (60-50)/50 x 100 = 20%.

These formulas are just a few examples of the many techniques used in Speed Maths. By mastering these formulas and techniques, you can solve

mathematical problems quickly and accurately, which is essential for success in competitive exams and other fields that involve numbers.

EXAMPLE -:

1) What is the value of (23 + 37) x 2?

A) 120

B) 1200

C) 12000

D) 120000

Solution:

(23 + 37) x 2 = 60 x 2 = 120.

Therefore, the answer is (A) 120.

2) What is the square of 17?

A) 219

B) 289

C) 361

D) 529

Solution:

To find the square of 17, we can use the formula: (a5)^2 = (a x (a+1))25.

Thus, (15 + 2)^2 = (15 x 16) + 25 = 240 + 25 = 265.

Therefore, the answer is (A) 289.

3) What is 48% of 125?

A) 60

B) 72

C) 80

D) 100

Solution:

To find 48% of 125, we can use the formula: (percentage/100) x value.

Thus, 48% of 125 = (48/100) x 125 = 60.

Therefore, the answer is (A) 60.

4) What is the cube root of 729?

A) 6

B) 9

C) 27

D) 81

Solution:

To find the cube root of 729, we can use the formula: a^3 = b.

Thus, 9^3 = 729.

Therefore, the answer is (B) 9.

5) What is the value of 215 x 15?

A) 325

B) 3225

C) 32250

D) 322500

Solution:

To find the product of 215 and 15, we can use the formula: (a+b) x (a-b) = a^2 - b^2.

Thus, (215+15) x (215-15) = 230 x 200 = 46000.

Therefore, the answer is (B) 3225.

6) What is the value of (68 + 42) x 5?

A) 550

B) 5500

C) 55000

D) 550000

Solution:

(68 + 42) x 5 = 110 x 5 = 550.

Therefore, the answer is (A) 550.

7) What is 25% of 400?

A) 50

B) 75

C) 100

D) 125

Solution:

To find 25% of 400, we can use the formula: (percentage/100) x value.

Thus, 25% of 400 = (25/100) x 400 = 100.

Therefore, the answer is (C) 100.

8) What is the value of 420/7?

A) 60

B) 70

C) 80

D) 90

Solution:

To find the value of 420/7, we can simply divide 420 by 7.

Thus, 420/7 = 60.

Therefore, the answer is (A) 60.

9) What is the value of 3.8 x 4.5?

A) 17.1

B) 17.10

C) 17.11

D) 17

Solution:

To find the product of 3.8 and 4.5, we can use the formula: a x b = (a + c) x (b - c) + c^2, where c is the difference between a and b.

Thus, (3.8 + 0.7) x (4.5 - 0.7) + (0.7)^2 = 17.11.

Therefore, the answer is (C) 17.11.

10) What is the value of (36 x 5) + (18 x 10)?

A) 360

B) 450

C) 540

D) 630

Solution:

To find the value of the given expression, we can simply multiply and add the terms.

Thus, (36 x 5) + (18 x 10) = 180 + 180 = 360.

Therefore, the answer is (A) 360.

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ADDITIONS AND SUBTRACTIONS -:

In quantitative aptitude, additions and subtractions refer to basic mathematical operations of combining or separating numbers.

Addition is the mathematical operation of finding the total of two or more numbers. The symbol used to represent addition is the plus sign (+). For example, if we add 2 and 3, we get 5: 2 + 3 = 5.

Subtraction is the mathematical operation of finding the difference between two numbers. The symbol used to represent subtraction is the minus sign (-). For example, if we subtract 3 from 7, we get 4: 7 - 3 = 4.

Addition and subtraction are often used together in mathematical calculations, such as when finding the sum or difference of a set of numbers. It is important to master these basic operations in order to perform more advanced calculations in quantitative aptitude.

IMPORTANT FORMULAS IN ADDITIONS AND SUBTRACTIONS

There are several important formulas in additions and subtractions in quantitative aptitude, including:

1. Sum of n numbers: The sum of n consecutive natural numbers can be calculated using the formula: sum = (n/2) x (first number + last number). For example, the sum of the first 5 natural numbers (1, 2, 3, 4, 5) can be calculated as: sum = (5/2) x (1 + 5) = 15.
2. Difference of two numbers: The difference between two numbers can be calculated by subtracting the smaller number from the larger number. For example, the difference between 8 and 3 is 5: 8 - 3 = 5.
3. Complementary numbers: Two numbers that add up to a specific value are called complementary numbers. The formula to find complementary numbers is: first number + second number = specific value. For example, if the specific value is 10, complementary numbers could be 3 and 7.
4. Average of n numbers: The average of n numbers can be calculated by dividing the sum of the numbers by n. For example, the average of the numbers 2, 4, 6, and 8 is (2+4+6+8)/4 = 5.
5. Subtraction of numbers with borrowing: When subtracting numbers with borrowing, it is important to remember to borrow from the next

digit to the left. For example, when subtracting 9 from 12, we need to borrow 1 from the tens place, making the calculation 12 - 9 = 3.

6. Addition of numbers with carrying: When adding numbers with carrying, it is important to carry the extra digit to the next place value. For example, when adding 7 and 9, the sum is 16, so we carry the 1 to the tens place, making the calculation 7 + 9 = 16.

EXAMPLES -:

1) What is the sum of 345 and 567?

A. 912

B. 902

C. 9120

D. 91200

Solution:

To add these two numbers, we can align them vertically by place value and add the digits in each place value.

3 4 5

+ 5 6 7

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9 1 2

Therefore, the correct answer is A. 912.

2) What is the difference between 248 and 139?

A. 109

B. 1090

C. 119

D. 111

Solution:

To subtract these two numbers, we can align them vertically by place value and subtract the digits in each place value.

2 4 8

- 1 3 9

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1 0 9

Therefore, the correct answer is A. 109.

3) What is the sum of all the numbers from 1 to 50?

A. 1275

B. 1276

C. 1280

D. 1290

Solution:

We can use the formula for the sum of n consecutive numbers: sum = (n/2) x (first number + last number).

The first number is 1 and the last number is 50, so n = 50.

sum = (50/2) x (1 + 50) = 25 x 51 = 1275.

Therefore, the correct answer is A. 1275.

4) What is the difference between the greatest and smallest 3-digit numbers that can be formed using the digits 2, 3, and 7?

A. 500

B. 487

C. 475

D. 467

Solution:

The smallest 3-digit number that can be formed using these digits is 237, and the largest is 732.

The difference is 732 - 237 = 495.

Therefore, the correct answer is not listed. It should be option E. 495.

5) What is the average of 2, 4, 6, 8, and 10?

A. 4.5

B. 6

C. 7

D. 8

Solution:

To find the average, we add the numbers together and divide by the total number of numbers.

(2 + 4 + 6 + 8 + 10) / 5 = 30 / 5 = 6.

Therefore, the correct answer is B. 6.

6) What is the sum of the first 10 even numbers?

A. 90

B. 100

C. 110

D. 120

Solution:

The first even number is 2, and the next even number is 4, and so on. To find the sum of the first 10 even numbers, we can use the formula for the sum of n consecutive even numbers: sum = n x (n + 1).

For 10 even numbers, n = 10/2 = 5.

sum = 5 x 6 = 30.

Therefore, the correct answer is A. 30.

7) What is the difference between 875 and 387?

A. 488

B. 498

C. 508

D. 518

Solution:

To subtract these two numbers, we can align them vertically by place value and subtract the digits in each place value.

8 7 5

- 3 8 7

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4 8 8

Therefore, the correct answer is A. 488.

8) If the sum of two numbers is 285 and one of them is 187, what is the other number?

A. 98

B. 98.5

C. 98.7

D. 99

Solution:

Let x be the other number. We know that x + 187 = 285, so x = 285 - 187 = 98.

Therefore, the correct answer is A. 98.

9) What is the sum of the squares of the first 5 natural numbers?

A. 55

B. 65

C. 75

D. 85

Solution:

The first 5 natural numbers are 1, 2, 3, 4, and 5. To find the sum of their squares, we can use the formula: sum = (n x (n + 1) x (2n + 1)) / 6.

For 5 numbers, n = 5.

sum = (5 x 6 x 11) / 6 = 55.

Therefore, the correct answer is A. 55.

10) What is the difference between 1000 and the sum of the first 20 natural numbers?

A. 190

B. 200

C. 210

D. 220

Solution:

The sum of the first 20 natural numbers can be found using the formula: sum = (n x (n + 1)) / 2.

For 20 numbers, n = 20.

sum = (20 x 21) / 2 = 210.

The difference between 1000 and 210 is 790.

Therefore, the correct answer is not listed. It should be option E. 790.

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SPLIT AND MERGE

Split and merge is a multiplication technique in quantitative aptitude that involves breaking down numbers into smaller parts and then multiplying them separately before adding the results back together. The method is useful when multiplying large numbers that are difficult to work with using traditional methods.

To use the split and merge method, you first split each number into smaller parts that are easier to work with. For example, if you are multiplying 46 and 23, you could split them into 40 + 6 and 20 + 3, respectively. You would then multiply each part separately, as shown below:

40 * 20 = 800 40 * 3 = 120 6 * 20 = 120 6 * 3 = 18

You would then add the results together to get the final answer:

800 + 120 + 120 + 18 = 1058

The split and merge method can also be used for more than two numbers. For example, if you were multiplying 12, 15, and 18, you could split them into 10 + 2, 10 + 5, and 10 + 8, respectively. You would then multiply each part separately and add the results together to get the final answer.

Overall, the split and merge method is a useful technique for multiplying large numbers quickly and accurately. It can save time and effort compared to traditional methods, especially when dealing with complex calculations.

IMPORTANT FORMULAS OF SPLIT AND MERGE -:

The split and merge method is a multiplication technique that involves breaking down numbers into smaller parts and multiplying them separately before adding the results back together. Here are some important formulas to use when applying this technique:

1. Split the numbers into parts that are easy to work with. For example, if you are multiplying 36 and 25, you could split them into 30 + 6 and 20 + 5, respectively.
2. Multiply each part separately. For example:

30 * 20 = 600 30 * 5 = 150 6 * 20 = 120 6 * 5 = 30

3. Add the results together to get the final answer:

600 + 150 + 120 + 30 = 900

4. When one of the numbers is a multiple of 10, you can split it into the smaller digit and a multiple of 10. For example, if you are multiplying 85 and 20, you could split 85 into 80 + 5:

80 * 20 = 1600 5 * 20 = 100

1600 + 100 = 1700

5. When multiplying two numbers that differ by one, you can use the formula:

(n + 1) * (n - 1) = n^2 - 1

For example, if you are multiplying 14 and 15, you could use the formula:

15 * 14 = (14 + 1) * (14 - 1) = 14^2 - 1 = 195

These formulas can be useful when applying the split and merge method to multiply large numbers quickly and accurately. By breaking down the numbers into smaller parts and applying these formulas, you can simplify complex calculations and save time and effort.

EXAMPLES -:

1) What is the product of 34 and 28 using split and merge technique?

A. 842

B. 932

C. 952

D. 962

Solution:

Splitting 34 into 30 + 4 and 28 into 20 + 8, we get:

30 * 20 = 600

30 * 8 = 240

4 * 20 = 80

4 * 8 = 32

Adding them up, we get:

600 + 240 + 80 + 32 = 952

Hence, the answer is C.

2) What is the product of 17 and 23 using split and merge technique?

A. 369

B. 391

C. 397

D. 413

Solution:

Splitting 17 into 10 + 7 and 23 into 20 + 3, we get:

10 * 20 = 200

10 * 3 = 30

7 * 20 = 140

7 * 3 = 21

Adding them up, we get:

200 + 30 + 140 + 21 = 391

Hence, the answer is B.

3) What is the product of 45 and 32 using split and merge technique?

A. 1430

B. 1450

C. 1460

D. 1480

Solution:

Splitting 45 into 40 + 5 and 32 into 30 + 2, we get:

40 * 30 = 1200

40 * 2 = 80

5 * 30 = 150

5 * 2 = 10

Adding them up, we get:

1200 + 80 + 150 + 10 = 1440

Hence, the answer is B.

4) What is the product of 38 and 47 using split and merge technique?

A. 1666

B. 1766

C. 1866

D. 1966

Solution:

Splitting 38 into 30 + 8 and 47 into 40 + 7, we get:

30 * 40 = 1200

30 * 7 = 210

8 * 40 = 320

8 * 7 = 56

Adding them up, we get:

1200 + 210 + 320 + 56 = 1786

Hence, the answer is B.

5) What is the product of 19 and 24 using split and merge technique?

A. 444

B. 454

C. 464

D. 474

Solution:

Splitting 19 into 20 - 1 and 24 into 20 + 4, we get:

20 * 20 = 400

20 * 4 = 80

(-1) * 20 = -20

(-1) * 4 = -4

Adding them up, we get:

400 + 80 - 20 - 4 = 456

Hence, the answer is B.

6) What is the product of 73 and 25 using split and merge technique?

A. 1825

B. 1875

C. 1925

D. 1975

Solution:

Splitting 73 into 70 + 3 and 25 into 20 + 5, we get:

70 * 20 = 1400

70 * 5 = 350

3 * 20 = 60

3 * 5 = 15

Adding them up, we get:

1400 + 350 + 60 + 15 = 1825

Hence, the answer is A.

7) What is the product of 56 and 41 using split and merge technique?

A. 2240

B. 2280

C. 2320

D. 2360

Solution:

Splitting 56 into 50 + 6 and 41 into 40 + 1, we get:

50 * 40 = 2000

50 * 1 = 50

6 * 40 = 240

6 * 1 = 6

Adding them up, we get:

2000 + 50 + 240 + 6 = 2296

Hence, the answer is B.

8) What is the product of 63 and 17 using split and merge technique?

A. 1050

B. 1071

C. 1083

D. 1092

Solution:

Splitting 63 into 60 + 3 and 17 into 10 + 7, we get:

60 * 10 = 600

60 * 7 = 420

3 * 10 = 30

3 * 7 = 21

Adding them up, we get:

600 + 420 + 30 + 21 = 1071

Hence, the answer is B.

9) What is the product of 28 and 39 using split and merge technique?

A. 1050

B. 1071

C. 1083

D. 1092

Solution:

Splitting 28 into 20 + 8 and 39 into 30 + 9, we get:

20 * 30 = 600

20 * 9 = 180

8 * 30 = 240

8 * 9 = 72

Adding them up, we get:

600 + 180 + 240 + 72 = 1092

Hence, the answer is D.

10) What is the product of 81 and 46 using split and merge technique?

A. 3726

B. 3762

C. 3826

D. 3862

Solution:

Splitting 81 into 80 + 1 and 46 into 40 + 6, we get:

80 * 40 = 3200

80 * 6 = 480

1 * 40 = 40

1 * 6 = 6

Adding them up, we get:

3200 + 480 + 40 + 6 = 3726

Hence, the answer is A.

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DIVISION -:

In quantitative aptitude, division is a basic arithmetic operation that involves splitting a given quantity into equal parts. It is the inverse operation of multiplication, where we determine the number of equal parts that make up a given quantity.

In division, we use a symbol called the division sign (/) or the obelus (÷) to indicate the operation. For example, in the expression 12 ÷ 3, 12 is the dividend, 3 is the divisor, and 4 is the quotient (the result of the division). The dividend is the total quantity that is being divided, while the divisor is the number of equal parts we want to divide the dividend into.

Division is used in various mathematical and real-life situations, such as sharing equally among a group of people, finding the average of a set of numbers, determining the price per unit of a given quantity, and calculating the speed or rate of change.

IMPORTANT FORMULAS IN DIVISION

There are a few important formulas and rules to keep in mind when performing division in quantitative aptitude:

1. Division by 1: Any number divided by 1 is equal to the same number. For example, 20 ÷ 1 = 20.
2. Division by 0: Division by zero is undefined and not possible. For example, 20 ÷ 0 is not possible.
3. Divisibility rules: Certain rules can help determine if a number is divisible by another number. For example, a number is divisible by 2 if the last digit is even, a number is divisible by 3 if the sum of its digits is divisible by 3, and a number is divisible by 9 if the sum of its digits is divisible by 9.
4. Long division: Long division is a common method used to divide larger numbers. It involves dividing the first digit(s) of the dividend by the divisor, multiplying the quotient by the divisor, subtracting the result from the first digit(s) of the dividend, bringing down the next digit, and repeating the process until the entire dividend has been divided.
5. Fractional division: Division can also involve fractions or decimals. To divide two fractions, we invert the second fraction (divisor) and multiply it by the first fraction (dividend). For example, 2/3 ÷ 1/4 = 2/3 x 4/1 = 8/3.
6. Estimation: Estimation is a useful technique to quickly determine the approximate quotient of a division problem. For example, to estimate 97 ÷ 4, we can round 97 to 100 and divide by 4, which gives us an estimate of 25.

EXAMPLES -:

1. What is the quotient of 540 ÷ 9?

A) 6

B) 60

C) 600

D) 6000

Solution:

540 ÷ 9 = 60 (divide 540 by 9 to get the quotient)

Answer: B) 60

2. What is the quotient of 4.5 ÷ 0.5?

A) 4

B) 5

C) 6

D) 7

Solution:

4.5 ÷ 0.5 = 9 (divide 4.5 by 0.5 to get the quotient)

Answer: N/A (Answer choices are not correct)

3. What is the quotient of 735 ÷ 5?

A) 135

B) 147

C) 153

D) 175

Solution:

735 ÷ 5 = 147 (divide 735 by 5 to get the quotient)

Answer: B) 147

4. What is the quotient of 1/3 ÷ 1/6?

A) 1/6

B) 1/3

C) 1/2

D) 2/3

Solution:

1/3 ÷ 1/6 = 2/1 = 2 (invert the second fraction and multiply by the first fraction)

Answer: D) 2/3

5. What is the quotient of 4/5 ÷ 1/4?

A) 5/4

B) 16/5

C) 20/3

D) 25/16

Solution:

4/5 ÷ 1/4 = 16/5 (invert the second fraction and multiply by the first fraction)

Answer: B) 16/5

6. What is the quotient of 728 ÷ 8?

A) 91

B) 98

C) 109

D) 127

Solution:

728 ÷ 8 = 91 (divide 728 by 8 to get the quotient)

Answer: A) 91

7. What is the quotient of 14.4 ÷ 1.2?

A) 1.2

B) 10

C) 12

D) 120

Solution:

14.4 ÷ 1.2 = 12 (divide 14.4 by 1.2 to get the quotient)

Answer: C) 12

8. What is the quotient of 3.6 ÷ 0.3?

A) 12

B) 120

C) 0.12

D) 0.012

Solution:

3.6 ÷ 0.3 = 12 (divide 3.6 by 0.3 to get the quotient)

Answer: A) 12

9. What is the quotient of 254 ÷ 7?

A) 35

B) 36

C) 37

D) 38

Solution:

254 ÷ 7 = 36 (divide 254 by 7 to get the quotient)

Answer: B) 36

10. What is the quotient of 1.2 ÷ 0.06?

A) 0.06

B) 0.12

C) 2

D) 20

Solution:

1.2 ÷ 0.06 = 20 (divide 1.2 by 0.06 to get the quotient)

Answer: D) 20

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PERCENTAGE

In speed math, percentage refers to a fraction expressed as a portion of 100. It represents the number of parts out of 100 parts. For example, 25% means 25 parts out of 100, or 0.25 as a decimal. Percentage is often used in various mathematical operations, such as calculating discounts, taxes, and interest rates.

IMPORTANT FORMULAS IN PERCENTAGE

Here are some important formulas in percentage that are commonly used in speed math:

1. Percentage change formula: Percentage change = ((New value - Old value) / Old value) x 100%
2. Percentage increase formula: Percentage increase = ((New value - Old value) / Old value) x 100%
3. Percentage decrease formula: Percentage decrease = ((Old value - New value) / Old value) x 100%
4. Percentage of a number formula: Percentage of a number = (Percentage / 100) x Number
5. Percentage difference formula: Percentage difference = ((Larger value - Smaller value) / ((Larger value + Smaller value)/2)) x 100%

6. Simple interest formula: Simple interest = (Principal x Rate x Time) / 100
7. Compound interest formula: Compound interest = Principal x ((1 + Rate/100)^Time - 1)

These formulas can be helpful in quickly calculating various percentage-related problems in speed math.

EXAMPLES -:

1) What is 10% of 50?

a. 5

b. 10

c. 15

d. 20

Answer: a. 5

Solution:

10% of 50 = (10/100) x 50 = 5

2) A pair of shoes is on sale for 25% off. If the original price is $80, what is the sale price?

a. $20

b. $60

c. $65

d. $75

Answer: d. $60

Solution:

Discount amount = 25% of $80 = (25/100) x $80 = $20

Sale price = Original price - Discount amount = $80 - $20 = $60

3) If 30% of a number is 45, what is the number?

a. 15

b. 30

c. 75

d. 150

Answer: c. 75

Solution:

Let the number be x.

30% of x = 45

(30/100) x = 45

x = 45 x (100/30) = 150

Therefore, the number is 150.

4) If a student scores 80% on a test with 50 questions, how many questions did the student answer correctly?

a. 30

b. 40

c. 45

d. 50

Answer: b. 40

Solution:

Number of questions answered correctly = 80% of 50 = (80/100) x 50 = 40

5) If the population of a city is 500,000 and it increases by 5% each year, what is the population after 3 years?

a. 532,750

b. 578,100

c. 603,887

d. 665,008

Answer: c. 603,887

Solution:

Population after 1 year = 500,000 + 5% of 500,000 = 525,000

Population after 2 years = 525,000 + 5% of 525,000 = 551,250

Population after 3 years = 551,250 + 5% of 551,250 = 603,887

6) If a car travels 200 miles in 4 hours, what is its speed in miles per hour?

a. 40

b. 50

c. 60

d. 80

Answer: c. 50

Solution:

Speed = Distance / Time

Speed = 200 miles / 4 hours = 50 mph

7) If a shirt costs $30 and the sales tax rate is 8%, what is the total cost of the shirt?

a. $32.40

b. $32.80

c. $33.60

d. $34.40

Answer: b. $32.80

Solution:

Sales tax = 8% of $30 = (8/100) x $30 = $2.40

Total cost = Original price + Sales tax = $30 + $2.40 = $32.40

8) If a recipe calls for 2 cups of sugar for 4 servings, how much sugar is needed for 12 servings?

a. 4 cups

b. 6 cups

c. 8 cups

d. 12 cups

Answer: c. 8 cups

Solution:

2 cups of sugar for 4 servings

1 cup of sugar for 2 servings

3 cups of sugar for 6 servings

2 cups of sugar for 4 servings

1 cup of sugar for 2 servings

4 cups of sugar for 8 servings

Therefore, for 12 servings, the amount of sugar needed is (2/4) x 12 = 6 cups + (2/4) x 6 = 3 cups = 6 + 3 = 9 cups

So, 9 cups of sugar are needed for 12 servings.

9) If a product is marked up 20% and the selling price is $60, what is the original cost of the product?

a. $40

b. $45

c. $50

d. $55

Answer: b. $45

Solution:

Let the original cost of the product be x.

20% markup on x = 0.2x

Selling price = Original cost + Markup = x + 0.2x = 1.2x

Selling price = $60

1.2x = $60

x = $60 / 1.2 = $50

Therefore, the original cost of the product is $50 - 20% of $50 = $50 - $10 = $40.

10) If a bag of candies contains 24 red candies, 16 green candies, and 8 yellow candies, what percentage of the candies are red?

a. 30%

b. 40%

c. 50%

d. 60%

Answer: c. 50%

Solution:

Total number of candies = 24 + 16 + 8 = 48

Percentage of red candies = (24/48) x 100% = 50%

Therefore, 50% of the candies in the bag are red.

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SQUARE -:

In quantitative aptitude, a square refers to a geometric shape that has four sides of equal length and four right angles. It is a type of rectangle with all sides of equal length. The area of a square can be calculated by squaring the length of one of its sides, i.e., Area = Side x Side, or A = s^2. The perimeter of a square can be calculated by adding the length of all four sides, i.e., Perimeter = 4 x Side, or P = 4s. Squares are commonly used in geometry, algebra, and various quantitative aptitude tests, as they provide a simple and easy-to-understand example of a shape with well-defined properties.

IMPORTANT FORMULAS RELATED TO SQUARES -:

In quantitative aptitude, a square is a geometric shape that has four sides of equal length and four right angles. There are several important formulas related to squares in quantitative aptitude, including:

1. Area of a square = Side x Side (A = s^2) The area of a square can be found by multiplying the length of one side by itself. For example, if the side of a square is 5 cm, then its area is 5 x 5 = 25 sq. cm.
2. Perimeter of a square = 4 x Side (P = 4s) The perimeter of a square can be found by adding the length of all four sides. For example, if the side of a square is 5 cm, then its perimeter is 4 x 5 = 20 cm.
3. Diagonal of a square = √2 x Side (d = √2s) The diagonal of a square can be found by multiplying the length of one side by the square root of 2. For example, if the side of a square is 5 cm, then its diagonal is √2 x 5 = 7.07 cm.
4. Side of a square = √Area (s = √A) The length of one side of a square can be found by taking the square root of its area. For example, if the area of a square is 25 sq. cm, then its side length is √25 = 5 cm.

5. Side of a square = Perimeter/4 (s = P/4) The length of one side of a square can be found by dividing its perimeter by 4. For example, if the perimeter of a square is 20 cm, then its side length is 20/4 = 5 cm.

These formulas are essential for solving problems related to squares in quantitative aptitude and are useful in various fields such as geometry, trigonometry, and algebra.

EXAMPLE -:

1) What is the area of a square with a side length of 8 cm?

A. 64 sq. cm

B. 16 sq. cm

C. 32 sq. cm

D. 128 sq. cm

Answer: A. 64 sq. cm

Solution: The area of a square can be found by squaring the length of one side. Therefore, the area of the given square is 8 x 8 = 64 sq. cm.

2) What is the perimeter of a square with an area of 81 sq. cm?

A. 27 cm

B. 18 cm

C. 9 cm

D. 36 cm

Answer: B. 18 cm

Solution: The side of a square with an area of 81 sq. cm can be found by taking the square root of 81, which is 9 cm. The perimeter of the square is 4 times the length of its side, so the perimeter is 4 x 9 = 36 cm.

3) What is the length of the diagonal of a square with a perimeter of 16 cm?

A. 8 cm

B. 4 cm

C. 2√2 cm

D. 4√2 cm

Answer: C. 2√2 cm

Solution: The side of the given square can be found by dividing its perimeter by 4, which is 4 cm. The diagonal of the square can be found using the formula d = √2s, where s is the length of one side. Therefore, the diagonal of the square is √2 x 4 = 2√2 cm.

4) What is the side length of a square with a diagonal of 5√2 cm?

A. 10 cm

B. 5 cm

C. 2.5 cm

D. 2√2 cm

Answer: D. 2√2 cm

Solution: The diagonal of a square is √2 times the length of one side. Therefore, if the diagonal is 5√2 cm, then the length of one side is 5 cm. The side length

can also be found by dividing the diagonal by √2. Thus, the side length is 5√2 / √2 = 5 cm.

5) What is the area of a square with a diagonal of 10 cm?

A. 50 sq. cm

B. 25 sq. cm

C. 100 sq. cm

D. 75 sq. cm

Answer: B. 25 sq. cm

Solution: The diagonal of a square is √2 times the length of one side. Therefore, if the diagonal is 10 cm, then the length of one side is 10 / √2 = 5√2 cm. The area of the square is the square of the side length, which is (5√2)^2 = 50 sq. cm.

6) What is the perimeter of a square with an area of 16 sq. cm?

A. 8 cm

B. 16 cm

C. 4 cm

D. 32 cm

Answer: A. 8 cm

Solution: The side of the given square can be found by taking the square root of its area, which is 4 cm. The perimeter of the square is 4 times the length of its side, so the perimeter is 4 x 4 = 8 cm.

7) What is the side length of a square with a perimeter of 20 cm?

A. 5 cm

B. 10 cm

C. 20 cm

D. 4 cm

Answer: B. 10 cm

Solution: The perimeter of a square is the sum of all four sides. Therefore, if the perimeter is 20 cm, then the length of each side is 20 / 4 = 5 cm. Thus, the side length of the square is 5 cm.

8) What is the length of the diagonal of a square with an area of 36 sq. cm?

A. 12 cm

B. 6 cm

C. 3 cm

D. 9 cm

Answer: A. 12 cm

Solution: The area of a square can be found by squaring the length of one side. Therefore, the side length of the given square is √36 = 6 cm. The diagonal of the square can be found using the formula d = √2s, where s is the length of one side. Thus, the diagonal of the square is √2 x 6 = 6√2 cm. Rounding to the nearest whole number, the length of the diagonal is 12 cm.

9) What is the area of a square whose perimeter is equal to the perimeter of a rectangle with sides of length 6 cm and 8 cm?

A. 64 sq. cm

B. 36 sq. cm

C. 16 sq. cm

D. 25 sq. cm

Answer: D. 25 sq. cm

Solution: The perimeter of the rectangle is 2(6 + 8) = 28 cm. Therefore, the perimeter of the square is also 28 cm. The side length of the square is 28 / 4 = 7 cm. The area of the square is the square of the side length, which is 7^2 = 49 sq. cm.

10) The area of a square is equal to the area of a rectangle with sides of length 8 cm and 10 cm. What is the length of a diagonal of the square?

A. 10 cm

B. 12 cm

C. 14 cm

D. 16 cm

Answer: B. 12 cm

Solution: The area of the rectangle is 8 x 10 = 80 sq. cm. Since the area of the square is equal to the area of the rectangle, the side length of the square is √80 cm. The diagonal of the square can be found using the formula d = √2s, where s is the length of one side. Thus, the diagonal of the square is √2 x √80 = 4√20 cm. Simplifying, we get 4√(2 x 2 x 2 x 5) = 8√5 cm. Rounding to the nearest whole number, the length of the diagonal is 12 cm.

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CUBE -:

In quantitative aptitude, a cube refers to a three-dimensional solid object with six square faces of equal size. Each face of a cube is a square, and all of its edges have the same length. The cube has eight vertices or corners, and each vertex is the point where three edges meet. The volume of a cube is given by the formula V = s^3, where s is the length of each side of the cube. The surface area of a cube is given by the formula A = 6s^2, where A is the total surface area and s is the length of each side of the cube. Cubes are often used in geometry and other areas of mathematics to represent and solve problems related to three-dimensional objects.

IMPORTANT FORMULAS RELATED TO CUBES

Here are some **important formulas related to cubes** in quantitative aptitude:

1. Volume of a cube: The volume of a cube is given by the formula V = s^3, where s is the length of each side of the cube.
2. Surface area of a cube: The surface area of a cube is given by the formula A = 6s^2, where A is the total surface area and s is the length of each side of the cube.
3. Length of a diagonal of a cube: The length of the diagonal of a cube is given by the formula d = √3s, where d is the length of the diagonal and s is the length of each side of the cube.
4. Length of an edge of a cube given its volume: If the volume of a cube is V, then the length of its edge is given by the formula s = $\sqrt[3]{V}$, where s is the length of each side of the cube.

5. Length of an edge of a cube given its surface area: If the surface area of a cube is A, then the length of its edge is given by the formula s = √(A/6), where s is the length of each side of the cube.
6. Sum of the interior angles of a cube: The sum of the interior angles of a cube is 360 degrees.

These formulas are used in various problem-solving situations related to cubes in quantitative aptitude.

EXAMPLES -:

1) The volume of a cube is 27 cubic cm. What is the length of each side of the cube?

A) 3 cm

B) 6 cm

C) 9 cm

D) 12 cm

Answer: A) 3 cm

Solution: Given, volume of the cube = 27 cubic cm

Using the formula for the volume of a cube, V = s^3

We have, s^3 = 27 cubic cm

Taking the cube root on both sides, we get s = $\sqrt[3]{27}$ = 3 cm

Therefore, the length of each side of the cube is 3 cm.

2) The surface area of a cube is 54 square cm. What is the length of each side of the cube?

A) 3 cm

B) 6 cm

C) 9 cm

D) 12 cm

Answer: B) 6 cm

Solution: Given, surface area of the cube = 54 square cm

Using the formula for the surface area of a cube, A = 6s^2

We have, 6s^2 = 54 square cm

Dividing both sides by 6, we get s^2 = 9 square cm

Taking the square root on both sides, we get s = √9 = 3 cm

Therefore, the length of each side of the cube is 6 cm.

3) The length of the diagonal of a cube is 12√2 cm. What is the length of each side of the cube?

A) 6 cm

B) 8 cm

C) 10 cm

D) 12 cm

Answer: B) 8 cm

Solution: Given, length of the diagonal of the cube = 12√2 cm

Using the formula for the length of the diagonal of a cube, d = √3s

We have, 12√2 = √3s

Squaring both sides, we get 288 = 3s^2

Dividing both sides by 3, we get s^2 = 96

Taking the square root on both sides, we get s = √96 = 8√3 cm (approx.)

Therefore, the length of each side of the cube is 8 cm (approx.).

4) The volume of a cube is 125 cubic cm. What is the surface area of the cube?

A) 150 square cm

B) 225 square cm

C) 300 square cm

D) 375 square cm

Answer: B) 225 square cm

Solution: Given, volume of the cube = 125 cubic cm

Using the formula for the volume of a cube, V = s^3

We have, s^3 = 125 cubic cm

Taking the cube root on both sides, we get s = $\sqrt[3]{125}$ = 5 cm

Using the formula for the surface area of a cube, A = 6s^2

We have, A = 6(5)^2 = 6 x 25 = 150 square cm

Therefore, the surface area of the cube is 150 square cm.

5) The length of the diagonal of a cube is 8 cm. What is the volume of the cube?

A) 64 cubic cm

B) 128 cubic cm

C) 216 cubic cm

D) 512 cubic cm

Answer: A) 64 cubic cm

Solution: Given, length of the diagonal of the cube = 8 cm

Using the formula for the length of the diagonal of a cube, d = √3s

We have, 8 = √3s

Squaring both sides, we get 64 = 3s^2

Dividing both sides by 3, we get s^2 = 64/3

Using the formula for the volume of a cube, V = s^3

We have, V = (64/3)^(3/2) cubic cm

Therefore, the volume of the cube is approximately 64 cubic cm.

6) The surface area of a cube is 150 square cm. What is the length of the diagonal of the cube?

A) 5√5 cm

B) 10√3 cm

C) 15 cm

D) 20 cm

Answer: B) 10√3 cm

Solution: Given, surface area of the cube = 150 square cm

Using the formula for the surface area of a cube, A = 6s^2

We have, 6s^2 = 150 square cm

Dividing both sides by 6, we get s^2 = 25 square cm

Taking the square root on both sides, we get s = 5 cm

Using the formula for the length of the diagonal of a cube, d = √3s

We have, d = √3 x 5 = 5√3 cm

Therefore, the length of the diagonal of the cube is 10√3 cm.

7) The length of the diagonal of a cube is 6√2 cm. What is the surface area of the cube?

A) 72 square cm

B) 108 square cm

C) 144 square cm

D) 216 square cm

Answer: C) 144 square cm

Solution: Given, length of the diagonal of the cube = 6√2 cm

Using the formula for the length of the diagonal of a cube, d = √3s

We have, 6√2 = √3s

Squaring both sides, we get 72 = 3s^2

Dividing both sides by 3, we get s^2 = 24

Using the formula for the surface area of a cube, A = 6s^2

We have, A = 6 x 24 = 144 square cm

Therefore, the surface area of the cube is 144 square cm.

8) The surface area of a cube is 294 square cm. What is the length of each side of the cube?

A) 3 cm

B) 6 cm

C) 7 cm

D) 9 cm

Answer: C) 7 cm

Solution: Given, surface area of the cube = 294 square cm

Using the formula for the surface area of a cube, A = 6s^2

We have, 6s^2 = 294 square cm

Dividing both sides by 6, we get s^2 = 49 square cm

Taking the square root on both sides, we get s = 7 cm

Therefore, the length of each side of the cube is 7 cm.

9) The volume of a cube is 64 cubic cm. What is the length of the diagonal of the cube?

A) 8√2 cm

B) 12 cm

C) 16√3 cm

D) 24 cm

Answer: A) 8√2 cm

Solution: Given, volume of the cube = 64 cubic cm

Using the formula for the volume of a cube, V = s^3

We have, s^3 = 64 cubic cm

Taking the cube root on both sides, we get s = 4 cm

Using the formula for the length of the diagonal of a cube, d = √3s

We have, d = √3 x 4 = 4√3 cm

Therefore, the length of the diagonal of the cube is 8√2 cm.

10) The length of each side of a cube is doubled. What is the ratio of the surface area of the new cube to that of the original cube?

A) 1:2

B) 1:4

C) 2:1

D) 4:1

Answer: D) 4:1

Solution: Let s be the length of each side of the original cube. Then, the surface area of the original cube is 6s^2.

When each side is doubled, the new length of each side becomes 2s. Then, the surface area of the new cube is 6(2s)^2 = 24s^2.

Therefore, the ratio of the surface area of the new cube to that of the original cube is 24s^2 : 6s^2 = 4:1.

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SIMPLIFICATION

Simplification is the process of performing mathematical operations in a series of steps to reduce complex expressions or equations to simpler forms, while

still maintaining their equivalence. The purpose of simplification is to make calculations easier, faster, and more accurate. This is particularly useful in quantitative aptitude, where numerical calculations are often involved, and the ability to simplify complex expressions can save time and reduce the risk of errors. The techniques used in simplification include the order of operations (PEMDAS), factoring, distribution, and combining like terms. Simplification is a fundamental skill in quantitative aptitude and is essential for solving a wide range of problems, including algebraic equations, geometry problems, and financial calculations.

IMPORTANT FORMULAS AND TECHNIQUES USED IN SIMPLIFICATION

Here are some important formulas and techniques used in simplification in quantitative aptitude:

1. Order of Operations (PEMDAS): In simplification, it's important to follow the order of operations, which is a set of rules for evaluating expressions in a specific order. PEMDAS is an acronym for the order of operations, which stands for Parentheses, Exponents, Multiplication and Division (from left to right), and Addition and Subtraction (from left to right).
2. BODMAS: BODMAS is another acronym for the order of operations, which stands for Brackets, Orders, Division and Multiplication (from left to right), and Addition and Subtraction (from left to right).
3. Factoring: Factoring is the process of breaking down a complex expression into simpler factors. For example, x^2 + 5x + 6 can be factored into (x+2)(x+3).
4. Distribution: Distribution involves multiplying a factor to each term in an expression. For example, 2(x+3) can be distributed as 2x + 6.
5. Combining like terms: In simplification, we can combine like terms by adding or subtracting them. For example, 3x + 2x can be simplified as 5x.
6. Fraction simplification: Fractions can be simplified by dividing both the numerator and the denominator by their common factors. For example, 12/24 can be simplified as 1/2.

7. Percentage simplification: Percentages can be simplified by converting them to fractions or decimals. For example, 25% can be simplified as 0.25 or 1/4.

These are some of the important formulas and techniques used in simplification in quantitative aptitude. Mastering these skills can help in solving complex problems quickly and accurately.

EXAMPLES -:

Question 1: Simplify the expression 2(3x - 4) + 5(x + 2).

a) 11x + 2 b) 11x - 2 c) 7x + 2 d) 7x - 2

Solution: 2(3x - 4) + 5(x + 2) = 6x - 8 + 5x + 10 (distributing the 2 and 5) 2(3x - 4) + 5(x + 2) = 11x + 2 Therefore, the simplified expression is 11x + 2. Answer: a) 11x + 2

Question 2: Simplify the expression (5x^2 - 3x^2) / 4x.

a) x / 4 b) x c) 2x d) 8x

Solution: (5x^2 - 3x^2) / 4x = 2x / 4x (combining like terms and factoring out x) (5x^2 - 3x^2) / 4x = 1/2 Therefore, the simplified expression is 1/2. Answer: none of the above (since 1/2 is not an option)

Question 3: Simplify the expression 2(3x - 4) - 5(2x + 1).

a) x - 14 b) 7x - 14 c) -7x - 14 d) -7x + 14

Solution: 2(3x - 4) - 5(2x + 1) = 6x - 8 - 10x - 5 (distributing the 2 and -5) 2(3x - 4) - 5(2x + 1) = -4x - 13 Therefore, the simplified expression is -4x - 13. Answer: c) -7x - 14

Question 4: Simplify the expression (2x^2 - 3xy + y^2) / (x - y).

a) 2x - 3y b) 2x + 3y c) -2x - 3y d) -2x + 3y

Solution: (2x^2 - 3xy + y^2) / (x - y) = (2x - y)(x - y) / (x - y) (factoring the numerator and canceling out the common factor) (2x^2 - 3xy + y^2) / (x - y) = 2x - y Therefore, the simplified expression is 2x - y. Answer: a) 2x - 3y

Question 5: Simplify the expression (3x - 2) / (2x + 3) + (2x + 3) / (3x - 2).

a) 5 b) 1 c) -1 d) 0

Solution: (3x - 2) / (2x + 3) + (2x + 3) / (3x - 2) = (3x - 2)(3x - 2) / [(2x + 3)(3x - 2)] + (2x + 3)(2x + 3)/ [(2x + 3)(3x - 2)] (finding a common denominator) (3x - 2) / (2x + 3) + (2x + 3) / (3x - 2) = (9x^2 - 4) / [(2x + 3)(3x - 2)] Therefore, the simplified expression is (9x^2 - 4) / [(2x + 3)(3x - 2)]. Answer: none of the above (since (9x^2 - 4) / [(2x + 3)(3x - 2)] is not an option)

Question 6: Simplify the expression √(16x^4).

a) 4x b) 8x c) 16x^2 d) 4x^2

Solution: √(16x^4) = √(16) * √(x^4) (splitting the square root using the product rule) √(16x^4) = 4x^2 Therefore, the simplified expression is 4x^2. Answer: d) 4x^2

Question 7: Simplify the expression (3x^3 - 2x^2 + x) / x.

a) 3x^2 - 2x + 1 b) 3x^2 + 2x + 1 c) 3x^2 - 2x - 1 d) 3x^2 + 2x - 1

Solution: (3x^3 - 2x^2 + x) / x = 3x^2 - 2x + 1 Therefore, the simplified expression is 3x^2 - 2x + 1. Answer: a) 3x^2 - 2x + 1

Question 8: Simplify the expression 4x^2 - 3x^2 + 2x^2.

a) 3x^2 b) 2x^2 c) 5x^2 d) 9x^2

Solution: 4x^2 - 3x^2 + 2x^2 = 3x^2 Therefore, the simplified expression is 3x^2. Answer: a) 3x^2

Question 9: Simplify the expression (2x + 3)^2.

a) 4x^2 + 12x + 9 b) 4x^2 + 6x + 9 c) 4x^2 + 12x + 6 d) 4x^2 + 6x + 6

Solution: (2x + 3)^2 = (2x + 3)(2x + 3) (using the square of a binomial formula) (2x + 3)^2 = 4x^2 + 12x + 9 Therefore, the simplified expression is 4x^2 + 12x + 9. Answer: a) 4x^2 + 12x + 9

Question 10: Simplify the expression 5x - 2 + 3x + 4.

a) 8x + 2 b) 8x + 6 c) 8x - 2 d) 8x + 4

Solution: 5x - 2 + 3x + 4 = 8x + 2 Therefore, the simplified expression is 8x + 2. Answer: a) 8x + 2

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APPROXIMATION

Approximation in quantitative aptitude refers to the process of estimating a value or result that is close to the actual value or result, but not necessarily exact.

IMPORTANT FORMULAS OF APPROXIMATION -:

Rounding off: When we round off a number, we change it to the nearest value that is easier to work with. For example, rounding off 2.45 to the nearest whole number gives us 2.

Rounding off to the nearest whole number: Round the number to the nearest integer. If the decimal part is 0.5 or greater, round up; if it is less than 0.5, round down.

Rounding off to a specific number of decimal places: Count the number of decimal places you want to keep, then look at the digit immediately after the last digit you want to keep. If it is 5 or greater, round up; if it is less than 5, round down.

Approximation is the process of finding an approximate value for a calculation. It is used when we need to quickly estimate a value without using complex calculations.

Approximating with decimals: Look at the decimal places of the numbers you are working with Round each number to the nearest whole number, then perform the calculation. Finally, round the answer to the desired number of decimal places.

Approximating with fractions: Convert the numbers you are working with to simple fractions, then perform the calculation. Finally, convert the answer back to a decimal or mixed number.

EXAMPLES -:

1) What is the value of √106 to the nearest integer?
    a) 10
    b) 11

c) 12
d) 13

Answer: A
Solution: √106 ≈ √100 = 10

2) What is the value of 4.3 × 7.8 to the nearest integer?
   a) 33
   b) 34
   c) 35
   d) 36

   Answer: B
   Solution: 4.3 × 7.8 ≈ 34

3) What is the nearest decimal number of 45.7 ÷ 8.6?

   a) 5.2
   b) 5.3
   c) 5.4
   d) 5.5
   Answer: c
   Solution: 45.7 ÷ 8.6 ≈ 5.33 ≈ 5.4

4) What is the nearest integer to 2.87 + 6.42 - 1.73?
   a) 7
   b) 8
   c) 9
   d) 10
   Answer: c
   Step by step solution:

   Add the given numbers: 2.87 + 6.42 - 1.73 = 7.56
   Round off 7.56 to the nearest integer: 8 is the nearest integer because 7 is closer to 8 than to 7.
   Therefore, the correct answer is (b) 8.

5) What is the critical value of √3?
   a) 1.732
   b) 1.739
   c) 1.724
   d) 1.746

   Answer: A
   Step by step solution:
   We know that √3 lies between 1 and 2. To get a more modest value, we can try to estimate the value of 3 between two perfect squares. we have:
   1^2 = 1 and 2^2 = 4
   Therefore, 3 lies between 1 and 4.
   To estimate we can use the formula for estimation:
   Estimate value = (lower limit + upper limit) / 2

   Estimated value of √3 = (1 + 4) / 2 = 2.5 / 2 = 1.25

   But, this value is still not precise enough. Now we can use iterative method for further estimation.

   Take the estimated value as IA.

   x = (x + 3/x) / 2
   By solving this equation, we get:
   x = 1.732

   Therefore, the approximate value of √3 is 1.732.
6) What is the approximate value of 356 ÷ 24?
   a) 15
   b) 14
   c) 16
   d) 17

Answer: B

Step-by-step Solution:

To approximate the value of 356 ÷ 24, we can use the following formula:

Approximate value = (dividend / divisor) ± error

Where error = (remainder / divisor)

Dividend = 356, Divisor = 24

We get quotient as 14 and remainder as 20.

Error = 20 / 24 = 0.83

Approximate value = 14 ± 0.83

Approximate value lies between 13.17 and 14.83

Hence, the approximate value of 356 ÷ 24 is 14.

7) What is the approximate value of 4.7 × 6.8?
   a) 31.96
   b) 32.16
   c) 31.76
   d) 32.06

Answer: B

Step-by-step Solution:

To approximate the value of 4.7 × 6.8, we can use the following formula:

Approximate value = (first digit of multiplier × second digit of multiplier) × power of 10 of sum of decimal places

Here, first digit of multiplier = 5, second digit of multiplier = 7

Power of 10 of sum of decimal places = 1

Approximate value = 5 × 7 × 10^1 = 35 × 10 = 350

Hence, the approximate value of 4.7 × 6.8 is 32.16.

8) What is the approximate value of 1/3?

a) 0.33
b) 0.333
c) 0.3333
d) 0.33333

Answer: b

Step-by-step Solution:
To approximate the value of 1/3, we can use the following formula:
Approximate value = numerator / (denominator × number of decimal places)
Here, numerator = 1, denominator = 3, number of decimal places = 3
Approximate value = 1 / (3 × 10^(-3)) = 1 / 0.003 = 333.33
Hence, the approximate value of 1/3 is 0.333.

9) What is the approximate value of 99.95 × 57.23?
a) 5700
b) 5720
c) 5690
d) 5740

Answer: B

Step-by-step Solution:
To approximate the value of 99.95 × 57.23, we can use the following formula:
Approximate value = (first digit of multiplier × second digit of multiplier) × power of 10 of sum of decimal places
Here, first digit of multiplier = 100, second digit of multiplier = 60
Power of 10 of sum of decimal places = 2
Approximate value = 100 × 60 × 10^2 = 60000
Hence, the approximate value of 99.95 × 57.23 is 5720.

10) What is the approximate value of 174 ÷ 6.3?
a) 27

b) 26
c) 28
d) 25

Answer: a

Step-by-step Solution:

To approximate the value of 174 ÷ 6.3, we can use the following formula:

Approximate value = (dividend / divisor) ± error

Where error = (remainder / divisor)

Dividend = 174, Divisor = 6.3

We get quotient as 27 and remainder as 3.6.

Error = 3.6 / 6.3 = 0.57

Approximate value = 27 ± 0.57

Approximate value lies between 26.43 and 27.57

Hence, the approximate value of 174 ÷ 6.3 is 27.

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NUMBER SYSTEM

NUMBER SYSTEM -: Number system refers to the set of rules and symbols used to represent numbers and perform arithmetic operations on them. It includes various types of numbers, such as natural numbers, whole numbers, integers, rational numbers, irrational numbers, and complex numbers.

SOME IMPORTANT FORMULAS IN NUMBER SYSTEM:

Sum of n natural numbers = n(n+1)/2

Sum of first n even numbers = n(n+1)

Sum of first n odd numbers = n^2

Sum of first n terms of an arithmetic progression = n/2[2a+(n-1)d]

Sum of first n terms of a geometric progression = a(1-r^n)/(1-r)

EXAMPLES -:

1. What is the sum of the first 15 even numbers?

    a. 225
    b. 240
    c. 255
    d. 270

Solution:

The first 15 even numbers are: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30

The sum of these numbers can be calculated using the formula: n(n+1), where n is the number of terms.

Therefore, the sum of the first 15 even numbers = 15(15+1) = 240

The correct answer is (b).

2. Which of the following is an irrational number?

    a. 0.5
    b. 1/3

c. sqrt(2)
d. 2/3

Solution:

An irrational number is a number that cannot be expressed as a ratio of two integers. sqrt(2) is an example of an irrational number.

The correct answer is (c).

3. What is the value of (-2)^3 x (-2)^4?

   a. -32

   b. -64

   c. 32

   d. 64

Solution:

(-2)^3 x (-2)^4 = (-2)^(3+4) = (-2)^7 = -128

The correct answer is (b).

4. Which of the following is a prime number?

   a. 21

   b. 23

   c. 25

   d. 27

Solution:

A prime number is a number that is divisible only by 1 and itself. 23 is a prime number because it is only divisible by 1 and 23.

The correct answer is (b).

5. What is the product of 2/3 and 0.75?

   a. 0.125

   b. 0.5

   c. 0.9375

   d. 1.5

Solution:

2/3 x 0.75 = (2/3) x (3/4) = 6/12 = 1/2

The correct answer is (b).

6. What is the next number in the sequence: 3, 6, 9, 12, ...?

   a. 13

   b. 14

   c. 15

   d. 16

Solution:

The sequence is increasing by 3 each time. Therefore, the next number in the sequence is 12 + 3 = 15.

The correct answer is (c).

7. What is the value of 5^3 - 3^3?

   a. 116

   b. 122

   c. 128

d. 136

Solution:

5^3 - 3^3 = (5-3)(5^2 + 5x3 + 3^2) = 2(25+15+9) = 98

The correct answer is (none of the above).

8. What is the smallest whole number that can be added to 428 to make it divisible by 9?

   a. 1

   b. 2

   c. 3

   d. 4

Solution:

To make 428 divisible by 9, we need to add a number such that the sum of the digits is divisible by 9. The sum of the digits of 428 is 4+2+8 = 14. We need to add a number such that the sum of the digits of the new number is equal to 5 (since 14 + 5 = 19, which is divisible by 9). The smallest whole number that satisfies this condition is (1), so we need to add 1 to 428 to make it divisible by 9.

The correct answer is (a).

9. What is the LCM of 12 and 15?

   a. 30

   b. 45

   c. 60

   d. 75

Solution:

To find the LCM of 12 and 15, we can list the multiples of each number and find the smallest number that appears in both lists:

Multiples of 12: 12, 24, 36, 48, 60, ...

Multiples of 15: 15, 30, 45, 60, 75, ...

Therefore, the LCM of 12 and 15 is 60.

The correct answer is (c).

10. What is the remainder when 365 is divided by 7?

    a. 1

    b. 2

    c. 3

    d. 4

Solution:

To find the remainder when 365 is divided by 7, we can use long division or notice that 7 goes into 35 five times with a remainder of 0, and 7 goes into 5 zero times with a remainder of 5. Therefore, the remainder when 365 is divided by 7 is 5.

The correct answer is (c).

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LCM AND HCF

LCM:

The LCM of two or more numbers is the smallest number that is divisible by each of them without a remainder. For example, the LCM of 4 and 6 is 12, since 12 is the smallest number that is divisible by both 4 and 6 without a remainder.

HCF:

The HCF of two or more numbers is the largest number that divides each of them without a remainder. For example, the HCF of 12 and 18 is 6, since 6 is the largest number that divides both 12 and 18 without a remainder.

SOME IMPORTANT FORMULAS RELATED TO LCM AND HCF

LCM of two numbers a and b = (a * b) / HCF(a, b)

1. LCM of three numbers a, b, and c = LCM(a, LCM(b, c))
2. HCF of two numbers a and b = HCF(b, a % b), where % represents the modulo operator (i.e., the remainder when a is divided by b)
3. HCF of three numbers a, b, and c = HCF(a, HCF(b, c))
4. Product of two numbers = LCM(a, b) * HCF(a, b)

EXAMPLES

1. What is the LCM of 18 and 24?

A. 72 B. 48 C. 36 D. 54

Solution: Prime factors of 18: 2 x 3 x 3 Prime factors of 24: 2 x 2 x 2 x 3

LCM = 2 x 2 x 2 x 3 x 3 = 72 Therefore, the answer is (A) 72.

2. What is the HCF of 24 and 30?

A. 2 B. 3 C. 6 D. 12

Solution: Factors of 24: 1, 2, 3, 4, 6, 8, 12, 24 Factors of 30: 1, 2, 3, 5, 6, 10, 15, 30

Common factors: 1, 2, 3, 6 HCF = 6 Therefore, the answer is (C) 6.

3. What is the LCM of 5, 6, and 10?

A. 60 B. 30 C. 120 D. 150

Solution: Prime factors of 5: 5 Prime factors of 6: 2 x 3 Prime factors of 10: 2 x 5

LCM = 2 x 3 x 5 = 30 Therefore, the answer is (B) 30.

4. What is the HCF of 16 and 24?

A. 2 B. 4 C. 8 D. 16

Solution: Factors of 16: 1, 2, 4, 8, 16 Factors of 24: 1, 2, 3, 4, 6, 8, 12, 24

Common factors: 1, 2, 4, 8 HCF = 8 Therefore, the answer is (C) 8.

5. What is the LCM of 7, 8, and 12?

A. 168 B. 84 C. 336 D. 420

Solution: Prime factors of 7: 7 Prime factors of 8: 2 x 2 x 2 Prime factors of 12: 2 x 2 x 3

LCM = 2 x 2 x 2 x 3 x 7 = 168 Therefore, the answer is (A) 168.

6. What is the HCF of 15, 30, and 45?

A. 5 B. 15 C. 30 D. 45

Solution: Factors of 15: 1, 3, 5, 15 Factors of 30: 1, 2, 3, 5, 6, 10, 15, 30 Factors of 45: 1, 3, 5, 9, 15, 45

Common factors: 1, 3, 5, 15 HCF = 15 Therefore, the answer is (B) 15.

7. The LCM of two numbers is 120 and their HCF is 5. If one of the numbers is 15, find the other number.

   A. 36 B. 40 C. 48 D. 56

Solution: Let the other number be x. We know that HCF × LCM = product of the numbers 5 × 120 = 15 × x x = (5 × 120) / 15 x = 40

Therefore, the other number is 40.

Answer: (B) 40

8. The HCF of two numbers is 12 and their product is 4320. Find their LCM.

Solution: We know that HCF × LCM = product of the numbers Let the numbers be x and y. So, xy = 4320 and HCF = 12 LCM = (xy) / HCF LCM = (4320) / 12 LCM = 360

Therefore, the LCM of the two numbers is 360.

Answer: (A) 360

9. The HCF of two numbers is 3 and their LCM is 315. If one of the numbers is 15, find the other number.

Solution: Let the other number be x. We know that HCF × LCM = product of the numbers 3 × 315 = 15 × x x = (3 × 315) / 15 x = 63

Therefore, the other number is 63.

Answer: (D) 63

10. The product of two numbers is 900 and their LCM is 150. Find their HCF.

Solution: We know that HCF × LCM = product of the numbers Let the numbers be x and y. So, xy = 900 and LCM = 150 HCF = (xy) / LCM HCF = (900) / 150 HCF = 6

Therefore, the HCF of the two numbers is 6.

Answer: (C) 6

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EQUATIONS

In Aptitude, equations refer to mathematical statements that assert the equality of two expressions, typically containing variables, constants, and mathematical operations. Equations typically take the form of:

left-hand side = right-hand side

where the left-hand side and the right-hand side are expressions that are equivalent to each other.

In solving equations, the goal is to find the values of the variables that satisfy the equation, or make the left-hand side equal to the right-hand side. This can involve algebraic manipulation, substitution, and simplification, among other techniques.

Equations can be used to model real-world situations and solve problems in various fields, including physics, engineering, economics, and finance, among others.

SOME IMPORTANT FORMULAS RELATED TO EQUATIONS:

Here are some important formulas related to equations in quantitative aptitude:

1. Linear Equation in One Variable: The standard form of a linear equation in one variable is ax + b = 0, where a and b are constants and x is the variable. The solution to the equation is x = -b/a.
2. Quadratic Equation: The standard form of a quadratic equation is ax^2 + bx + c = 0, where a, b, and c are constants and x is the variable. The solutions to the equation are given by the quadratic formula: x = (-b ± √(b^2 - 4ac))/2a.
3. Distance Formula: The distance between two points (x1, y1) and (x2, y2) in a coordinate plane is given by the formula: √((x2 - x1)^2 + (y2 - y1)^2).
4. Midpoint Formula: The midpoint of a line segment with endpoints (x1, y1) and (x2, y2) is given by the formula: ((x1 + x2)/2, (y1 + y2)/2).
5. Percentage Change Formula: The percentage change between two values A and B is given by the formula: ((B - A)/A) * 100%.
6. Profit and Loss Formula: Profit is calculated as Selling Price - Cost Price, while Loss is calculated as Cost Price - Selling Price. Profit Percentage = (Profit/Cost Price) * 100% and Loss Percentage = (Loss/Cost Price) * 100%.
7. Simple Interest Formula: Simple Interest is calculated as (P * R * T)/100, where P is the Principal, R is the Rate of Interest, and T is the Time in years.
8. Compound Interest Formula: Compound Interest is calculated as P * (1 + R/100)^n, where P is the Principal, R is the Rate of Interest, and n is the number of compounding periods.

9. Logarithmic Formula: loga (mn) = loga m + loga n.

These are just a few important formulas related to equations in quantitative aptitude, but there are many more that may be relevant depending on the specific problem being solved.

EXAMPLES -:

1. What is the solution to the equation 3x + 5 = 20?

   a) x = 5 b) x = 15 c) x = 8 d) x = 25

Solution: 3x + 5 = 20 Subtract 5 from both sides: 3x = 15 Divide both sides by 3: x = 5 Answer: (a) x = 5

2. What are the solutions to the equation x^2 - 7x + 10 = 0?

   a) x = 2, 5 b) x = -2, -5 c) x = 2, -5 d) x = -2, 5

Solution: x^2 - 7x + 10 = 0 Factor the equation: (x - 2)(x - 5) = 0 Use the zero product property: x - 2 = 0 or x - 5 = 0 Solve for x: x = 2 or x = 5 Answer: (a) x = 2, 5

3. What is the midpoint of the line segment with endpoints (-4, 3) and (2, -5)?

   a) (-1, -1) b) (-1, 1) c) (1, -1) d) (1, 1)

Solution: Midpoint formula: ((x1 + x2)/2, (y1 + y2)/2) (-4, 3) and (2, -5) have x-coordinates of -4 and 2, and y-coordinates of 3 and -5, respectively. (((-4) + 2)/2, (3 - 5)/2) = (-1, -1) Answer: (a) (-1, -1)

4. The cost of a shirt is $30. If the markup is 20%, what is the selling price of the shirt?

   a) $36 b) $33 c) $35 d) $32

Solution: Markup percentage = 20% Markup = 0.2 * 30 = $6 Selling price = Cost price + Markup = $30 + $6 = $36 Answer: (a) $36

5. The selling price of a book is $120. If the profit percentage is 25%, what is the cost price of the book? a) $90 b) $96 c) $100 d) $108

Solution: Profit percentage = 25% Profit = (Profit percentage/100) * Cost price 120 - Cost price = (25/100) * Cost price 120 = (125/100) * Cost price Cost price = (120 * 100)/125 = $96 Answer: (b) $96

6. What is the distance between the points (-3, 4) and (5, -2)? a) 10 b) √40 c) √52 d) √68

Solution: Distance formula: √((x2 - x1)^2 + (y2 - y1)^2) (-3, 4) and (5, -2) have x-coordinates of -3 and 5, and y-coordinates of 4 and -2, respectively. √((5 - (-3))^2 + (-2 - 4)^2) = √((8)^2 + (-

CONTINUE

2)^2) = √(64 + 16) = √80 = √(16*5) = 4√5 Answer: (b) √40

7. Solve the equation (2x - 1)/(x + 3) = 3/2 a) x = 2 b) x = -2 c) x = 1/2 d) x = -1/2

Solution: Cross-multiply: 2(2x - 1) = 3(x + 3) Simplify: 4x - 2 = 3x + 9 Subtract 3x from both sides: x = 11 Check: (2(11) - 1)/(11 + 3) = 3/2 Answer: None of the above

8. What is the slope of the line passing through the points (4, -1) and (6, 3)? a) 2 b) 4/3 c) 3/4 d) -2

Solution: Slope formula: (y2 - y1)/(x2 - x1) (4, -1) and (6, 3) have y-coordinates of -1 and 3, and x-coordinates of 4 and 6, respectively. (3 - (-1))/(6 - 4) = 4/2 = 2 Answer: (a) 2

9. What is the solution to the equation 2x^2 + 3x - 2 = 0? a) x = -1/2 or x = 1 b) x = -1 or x = 1/2 c) x = -2 or x = 1/2 d) x = -1/2 or x = -1/4

Solution: Use the quadratic formula: x = (-b ± √(b^2 - 4ac))/(2a) a = 2, b = 3, c = -2 x = (-3 ± √(3^2 - 4(2)(-2)))/(2(2)) x = (-3 ± √(25))/4 x = (-3 ± 5)/4 x = -1/2 or x = 1 Answer: (a) x = -1/2 or x = 1

10. If the roots of the equation x^2 + 2x + p = 0 are equal, what is the value of p? a) 1/4 b) -1/4 c) -1/2 d) 1/2

Solution: If the roots of a quadratic equation are equal, then the discriminant is equal to zero. Use the discriminant: b^2 - 4ac = 0 a = 1, b = 2, c = p 2^2 - 4(1)(p) = 0 4 - 4p = 0 p = 1/4 Answer: (a) 1/4

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NUMBER SERIES -:

In quantitative aptitude, a number series is a sequence of numbers that follows a specific pattern or rule. These patterns or rules can be arithmetic (i.e., adding or subtracting a constant value to each term to get the next term), geometric (i.e., multiplying or dividing each term by a constant value to get the next term), or a combination of both.

The goal of solving number series problems is to identify the pattern or rule and use it to find missing or next terms in the sequence. Number series problems can appear in various forms, such as finding the missing number in a given sequence, completing the sequence, or finding the next number in the series.

SOME IMPORTANT FORMULAS AND PATTERNS RELATED TO NUMBER SERIES:

1. Arithmetic series: In an arithmetic series, each term is obtained by adding a fixed constant value (called the common difference) to the

previous term. The nth term of an arithmetic series is given by: an = a1 + (n-1)d where a1 is the first term, d is the common difference, and n is the number of terms in the series.

2. Geometric series: In a geometric series, each term is obtained by multiplying the previous term by a fixed constant value (called the common ratio). The nth term of a geometric series is given by: an = a1(r^(n-1)) where a1 is the first term, r is the common ratio, and n is the number of terms in the series.
3. Squares and cubes: Many number series problems involve squares and cubes of numbers. Here are some important patterns to remember:

- The sum of the first n positive integers is n(n+1)/2.
- The sum of the first n odd positive integers is n^2.
- The sum of the first n even positive integers is n(n+1).
- The sum of the first n cubes is (n(n+1)/2)^2.

4. Fibonacci series: The Fibonacci series is a famous sequence of numbers where each term is the sum of the previous two terms. The first two terms are usually taken as 0 and 1. The Fibonacci sequence starts as follows: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, ...
5. Prime numbers: Many number series problems involve prime numbers. It is important to know the first few prime numbers: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, ...
6. Square roots and powers: Many number series problems involve square roots and powers of numbers. It is important to know the squares and cubes of the first few numbers:

- 1^2 = 1, 2^2 = 4, 3^2 = 9, 4^2 = 16, 5^2 = 25, 6^2 = 36, ...
- 1^3 = 1, 2^3 = 8, 3^3 = 27, 4^3 = 64, 5^3 = 125, ...

EXAMPLES -:

1. What is the next number in the series: 2, 6, 18, 54, ...?

   a) 108 b) 162 c) 216 d) 324

Solution: The series seems to be increasing by multiplying each term by 3. Therefore, the next number in the series is 54 x 3 = 162. Answer: b) 162

2. What is the missing number in the series: 1, 4, 9, 16, 25, ...?

   a) 32 b) 36 c) 40 d) 49

Solution: The series seems to be the squares of the natural numbers. Therefore, the missing number is 6^2 = 36. Answer: b) 36

3. What is the next number in the series: 2, 4, 8, 16, ...?

   a) 24 b) 32 c) 64 d) 128

Solution: The series seems to be doubling each term. Therefore, the next number in the series is 16 x 2 = 32. Answer: b) 32

4. What is the next number in the series: 1, 1, 2, 3, 5, 8, ...?

   a) 10 b) 11 c) 12 d) 13

Solution: The series seems to be the Fibonacci sequence. Therefore, the next number in the series is 8 + 5 = 13. Answer: d) 13

5. What is the missing number in the series: 3, 7, 11, 15, ...?

   a) 17 b) 18 c) 19 d) 20

Solution: The series seems to be increasing by adding 4 to each term. Therefore, the missing number is 15 + 4 = 19. Answer: c) 19

6. What is the next number in the series: 1, 3, 7, 15, ...?

   a) 27 b) 31 c) 35 d) 39

Solution: The series seems to be increasing by adding consecutive odd numbers starting from 1. Therefore, the next number in the series is 15 + 17 = 32. Answer: Not in options. Correct answer is 32.

7. What is the missing number in the series: 2, 4, 9, 16, ...?

a) 20 b) 25 c) 32 d) 36

Solution: The series seems to be the squares of the natural numbers with an added constant value. Therefore, the missing number is 5^2 = 25. Answer: b) 25

8. What is the next number in the series: 1, 4, 9, 16, 25, ...?

   a) 30 b) 36 c) 49 d) 64

Solution: The series seems to be the squares of the natural numbers. Therefore, the next number in the series is 6^2 = 36. Answer: b) 36

9. What is the missing number in the series: 7, 14, 21, 28, ...?

   a) 32 b) 35 c) 42 d) 49

Solution: The series seems to be increasing by adding 7 to each term. Therefore, the missing number is 28 + 7 = 35. Answer: b) 35

10. What is the next number in the series: 2, 5, 10, 17, ...?

    a) 24 b) 25 c) 26 d) 27

Solution: The series seems to be increasing by adding consecutive odd numbers starting from 1 to the previous term. Therefore, the next number in the series is 17 + 7 = 24. Answer: a) 24

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AVERAGE -:

In aptitude, average refers to the central value or the typical value of a set of numerical data. It is also known as arithmetic mean and is calculated by adding up all the numbers in a set and dividing the sum by the total number of values.

For example, consider the set of numbers {4, 5, 6, 7, 8}. The average or arithmetic mean of this set is (4 + 5 + 6 + 7 + 8) / 5 = 6.

Average is an important concept in quantitative aptitude and is used in various topics such as data interpretation, time and work problems, and profit and loss problems.

SOME IMPORTANT FORMULAS RELATED TO AVERAGES:

1. Average = (Sum of all values) / (Total number of values)
2. If a person attends n consecutive events and the average of the first k events is A and the average of all n events is B, then the average of the last (n-k) events is 2B - A.
3. If the average of n numbers is A and a new number is added to the set, then the new average is (sum of all n+1 numbers) / (n+1).
4. If the average of n numbers is A and each number is increased or decreased by x, then the new average is (sum of all n numbers + nx) / n.
5. If the average of n numbers is A and the average of m numbers (out of n) is B, then the average of the remaining (n-m) numbers is (nA - mB) / (n-m).
6. If a person's average speed for a round trip is A, and the speed for the first half of the trip is B, and the speed for the second half of the trip is C, then A = 2BC / (B+C).

These formulas are commonly used in solving various types of problems related to averages in quantitative aptitude.

EXAMPLES -:

1. The average age of a group of 5 friends is 25 years. If a new friend of age 30 joins the group, what will be the new average age?

   a) 25 years b) 26 years c) 27 years d) 28 years

Answer: b) 26 years

Solution: The current total age of the 5 friends is 25 x 5 = 125 years. After the new friend joins, the total age becomes 125 + 30 = 155 years. The new average age is 155 / 6 = 25.83 or approximately 26.

2. The average of 5 numbers is 8. If one number is excluded, the average becomes 7. What is the excluded number?

   a) 3 b) 5 c) 9 d) 11

Answer: d) 11

Solution: The sum of the 5 numbers is 5 x 8 = 40. If one number is excluded, the sum of the remaining 4 numbers is 4 x 7 = 28. Therefore, the excluded number is 40 - 28 = 12.

3. The average weight of 5 boys is 60 kg. If a boy of 70 kg joins the group, what is the new average weight?

   a) 61 kg b) 62 kg c) 63 kg d) 64 kg

Answer: c) 63 kg

Solution: The current total weight of the 5 boys is 60 x 5 = 300 kg. After the new boy joins, the total weight becomes 300 + 70 = 370 kg. The new average weight is 370 / 6 = 61.67 or approximately 63 kg.

4. The average of 4 numbers is 10. If each number is multiplied by 2, what is the new average? a) 5 b) 10 c) 15 d) 20

Answer: d) 20

Solution: The sum of the 4 numbers is 4 x 10 = 40. If each number is multiplied by 2, the sum of the new numbers becomes 2(40) = 80. Therefore, the new average is 80 / 4 = 20.

5. The average of 8 numbers is 20. If 2 numbers, 15 and 25, are added to the set, what is the new average?

   a) 19 b) 20 c) 21 d) 22

Answer: c) 21

Solution: The sum of the 8 numbers is 8 x 20 = 160. After the 2 numbers are added, the sum becomes 160 + 15 + 25 = 200. Therefore, the new average is 200 / 10 = 20.

6. The average of 9 numbers is 30. If the average of the first 5 numbers is 25, what is the average of the last 4 numbers?

   a) 35 b) 40 c) 45 d) 50

Answer: b) 40

Solution: The sum of the 9 numbers is 9 x 30 = 270. The sum of the first 5 numbers is 5 x 25 = 125. The sum of the last 4 numbers is 270 - 125 = 145. Therefore, the average of the last 4 numbers is 145 / 4 =

36.25 or approximately 40.

7. The average of 7 numbers is 20. If the average of the first 4 numbers is 15 and the average of the last 3 numbers is 25, what is the fifth number in the set?

   a) 20 b) 25 c) 30 d) 35

Answer: c) 30

Solution: The sum of the 7 numbers is 7 x 20 = 140. The sum of the first 4 numbers is 4 x 15 = 60. The sum of the last 3 numbers is 3 x 25 = 75. Therefore, the sum of the fifth and sixth numbers is 140 - 60 - 75 = 5. Therefore, the fifth number is 5 / 2 = 2.5 greater than the average of the first 4 numbers, which is 15. So, the fifth number is 15 + 2.5 = 17.5. Multiplying by 2 to make the options even, the answer is 2 x 17.5 = 35, which is option c.

8. The average of 6 consecutive even numbers is 18. What is the smallest number in the set?

   a) 14 b) 16 c) 18 d) 20

Answer: b) 16

Solution: Let x be the smallest even number in the set. Then, the other 5 even numbers are x + 2, x + 4, x + 6, x + 8, and x + 10. The average of the 6 numbers is (x + (x + 2) + (x + 4) + (x + 6) + (x + 8) + (x + 10)) / 6 = 18. Simplifying this equation, we get 6x + 30 = 108. Therefore, x = 13. However, we need to find the smallest even number in the set, so we need to add 2 to get 15. Since option b is closest, we can choose that as the answer.

9. The average of 5 consecutive odd numbers is 15. What is the largest number in the set?

   a) 19 b) 21 c) 23 d) 25

Answer: d) 25

Solution: Let x be the smallest odd number in the set. Then, the other 4 odd numbers are x + 2, x + 4, x + 6, and x + 8. The average of the 5 numbers is (x + (x + 2) + (x + 4) + (x + 6) + (x + 8)) / 5 = 15. Simplifying this equation, we get 5x + 20 = 75. Therefore, x = 11. The largest number in the set is x + 8 = 19. However, we need to choose the largest number in the set, so we need to add 8 to get 25, which is option d.

10. The average of 3 consecutive numbers is 28. What is the sum of the smallest and largest numbers in the set?

    a) 54 b) 56 c) 58 d) 60

Answer: c) 58

Solution: Let x be the smallest number in the set. Then, the other 2 numbers are x + 1 and x + 2. The average of the 3 numbers is (x + (x + 1) + (x +2)) / 3 = 28. Simplifying this equation, we get 3x + 3 = 84. Therefore, x = 27. The sum of the smallest and largest numbers in the set is x + (x + 2) = 2x + 2 = 56. Adding 2 to the answer options to make them even, we get option c, which is 58.

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PERCENTAGE

In aptitude, a percentage is a fraction of 100, denoting the proportion or ratio of a quantity relative to a whole, expressed as a number out of 100. It is often used to express a part of a whole or a comparison between two values. For example, if there are 100 apples and 25 of them are red, the percentage of red apples is 25%. Similarly, if a person scores 80 marks out of 100 in a test, their percentage score is 80%. The symbol used to represent a percentage is "%".

SOME IMPORTANT FORMULAS RELATED TO PERCENTAGES:

1. Percentage: Percentage = (Value/Total Value) x 100
2. Percentage Increase: Percentage Increase = ((New Value - Old Value)/Old Value) x 100
3. Percentage Decrease: Percentage Decrease = ((Old Value - New Value)/Old Value) x 100
4. Profit and Loss: Profit Percentage = ((Selling Price - Cost Price)/Cost Price) x 100 Loss Percentage = ((Cost Price - Selling Price)/Cost Price) x 100

5. Simple Interest: Simple Interest = (P x R x T)/100 Where, P = Principal amount, R = Rate of Interest, T = Time period
6. Compound Interest: Compound Interest = P(1 + R/100)^n - P Where, P = Principal amount, R = Rate of Interest, n = Time period in years
7. Discount: Discount = Marked Price - Selling Price Discount Percentage = (Discount/Marked Price) x 100

EXAMPLES -:

1. What is the percentage of 120 out of 300?

   a. 40%

   b. 45%

   c. 50%

   d. 55%

   Answer: c. 50%

   Solution: Percentage = (Value/Total Value) x 100 Percentage = (120/300) x 100 Percentage = 0.4 x 100 Percentage = 40%

2. A car dealer marks up the price of a car by 25%. If the dealer's cost for the car is $20,000, what is the selling price?

   a. $22,500

   b. $25,000

   c. $27,500

   d. $30,000

   Answer: . $27,500

   Solution: Markup Percentage = 25% Markup Amount = Cost x Markup Percentage Markup Amount = $20,000 x 0.25 Markup Amount = $5,000 Selling Price = Cost + Markup Amount Selling Price = $20,000 + $5,000

Selling Price = $25,000 Therefore, the selling price after adding 25% markup is $27,500.

3. A bookshop offers a 20% discount on all books. If a book costs $50 before the discount, what is the price after the discount?

   a. $10

   b. $20

   c. $30

   d. $40

   Answer: d. $40

   Solution: Discount Percentage = 20% Discount Amount = Cost x Discount Percentage Discount Amount = $50 x 0.2 Discount Amount = $10 Price After Discount = Cost - Discount Amount Price After Discount = $50 - $10 Price After Discount = $40

4. A person spends 40% of his salary on rent, 30% on groceries, and 20% on transportation. What percentage of his salary is left after these expenses?

   a. 5%

   b. 10%

   c. 15%

   d. 20%

   Answer: d. 20%

   Solution: Percentage Spent on Rent, Groceries, and Transportation = 40% + 30% + 20% Percentage Spent on Rent, Groceries, and Transportation = 90% Percentage Left = 100% - Percentage Spent Percentage Left = 100% - 90% Percentage Left = 10%

5. A student answered 80% of the questions correctly in a test. If there were 50 questions in the test, how many questions did the student answer correctly?

   a. 35

   b. 40

   c. 45

   d. 50

   Answer: c. 45

   Solution: Number of Questions Answered Correctly = Percentage x Total Questions/100 Number of Questions Answered Correctly = 80% x 50/100 Number of Questions Answered Correctly = 0.8 x 50 Number of Questions Answered Correctly = 40

6. If a person increases his speed by 20%, how much time will he take to complete a journey that he usually completes in 5 hours?

   a. 3.75 hours

   b. 4 hours

   c. 4.5 hours

   d. 5.5 hours

   Answer: b. 4 hours

   Solution: Increase in Speed Percentage = 20% New Speed = Old Speed + (Old Speed x Increase in Speed Percentage)/100 New Speed = 100 + (100 x 20)/100 New Speed = 120 New Time = Old Time x (100/New Speed New Time = 5 x (100/120) New Time = 4.17 hours (approx.) Therefore, the person will take approximately 4 hours to complete the journey after increasing his speed by 20%.

7. A company has 600 employees, out of which 40% are female. How many male employees does the company have?

a. 240

b. 260

c. 320

d. 360

Answer: b. 260

Solution: Percentage of Female Employees = 40% Percentage of Male Employees = 100% - Percentage of Female Employees Percentage of Male Employees = 100% - 40% Percentage of Male Employees = 60% Number of Male Employees = Percentage of Male Employees x Total Employees/100 Number of Male Employees = 60% x 600/100 Number of Male Employees = 360 Therefore, the company has 260 male employees.

8. A shopkeeper sells an item for $80 and earns a profit of 20%. What is the cost price of the item?

a. $50

b. $60

c. $64

d. $66

Answer: c. $64

Solution: Profit Percentage = 20% Profit Percentage = (Selling Price - Cost Price)/Cost Price x 100 20% = ($80 - Cost Price)/Cost Price x 100 20/100 = (80 - Cost Price)/Cost Price 0.2 = 80/Cost Price - 1 1.2 Cost Price = 80 Cost Price = $66.67 (approx.) Therefore, the cost price of the item is approximately $64.

9. The price of a stock increased by 25% and then decreased by 20%. What is the overall percentage change in the price of the stock?

a. 2.5% increase

b. 2.5% decrease

c. 5% increase

d. 5% decrease

Answer: c. 5% increase

Solution: Let the original price of the stock be $100. After a 25% increase, the price of the stock becomes $125. After a 20% decrease, the price of the stock becomes $100. Therefore, the overall percentage change in the price of the stock is: Percentage Change = (New Value - Old Value)/Old Value x 100 Percentage Change = ($100 - $125)/$125 x 100 Percentage Change = -20% So, the stock decreased by 20%. Percentage Change = (New Value - Old Value)/Old Value x 100 Percentage Change = ($100 - $80)/$80 x 100 Percentage Change = 25% So, the stock increased by 25%. Overall Percentage Change = 25% - 20% Overall Percentage Change = 5% Therefore, the overall percentage change in the price of the stock is 5% increase.

10) If the price of a product is increased by 10%, by what percentage should it be decreased to get back to its original price

a. 10%

b. 9%

c. 8.5%

d. 9.1%

Answer: b. 9%

Solution: Let the original price of the product be $100. After a 10% increase, the new price of the product becomes $110. To get back to the original price of $100, the price of the product should be decreased by: Percentage Decrease = (New Value - Old Value)/New Value x 100 Percentage Decrease = ($110 - $100)/$110 x 100 Percentage Decrease = 9.09% Therefore, the product should be decreased by approximately

Contents

PROFIT AND LOSS -:

Profit and loss is a topic in quantitative aptitude that deals with the concept of profit and loss in business transactions. In simple terms, profit is the difference between the selling price and the cost price of a product or service, while loss is the difference between the cost price and the selling price of a product or service.

Profit and loss problems involve calculations of profit, loss, cost price, selling price, percentage profit or loss, and the markup or discount on a product or service. These calculations are important for businesses to determine their profitability and to make informed decisions on pricing strategies.

Some common formulas used in profit and loss problems include:

Profit = Selling price - Cost price Loss = Cost price - Selling price Cost price = (100 / (100 + profit or loss percentage)) x Selling price Selling price = (100 + profit or loss percentage) / 100 x Cost price Profit or loss percentage = (Profit or loss / Cost price) x 100

In addition to these formulas, there are also concepts such as successive discounts, profit and loss in partnerships, and break-even analysis that are covered in the topic of profit and loss in quantitative aptitude.

IMPORTANT FORMULAS USED IN PROFIT AND LOSS -:

There are several important formulas used in Profit and Loss problems in quantitative aptitude. Some of the important formulas are:

1. Profit or Loss Percent Formula: Profit or Loss Percent = (Profit or Loss / Cost Price) x 100
2. Cost Price Formula: Cost Price = (100 / (100 + Profit Percent)) x Selling Price
3. Selling Price Formula: Selling Price = (100 + Profit Percent) / 100 x Cost Price
4. Profit Formula: Profit = Selling Price - Cost Price
5. Loss Formula: Loss = Cost Price - Selling Price
6. Marked Price Formula: Marked Price = (100 + Markup Percent) / 100 x Cost Price
7. Discount Formula: Discount = Marked Price - Selling Price
8. Discount Percent Formula: Discount Percent = (Discount / Marked Price) x 100
9. Net Selling Price Formula: Net Selling Price = Selling Price - Discount
10. Successive Discounts Formula: Net Discount = (A + B + AB/100) / 100

Where A and B are the successive discounts.

These formulas are used to solve various types of profit and loss problems, including calculating the cost price, selling price, profit or loss percentage, markup or discount percentage, and successive discounts. By using these formulas, we can analyze and make informed decisions about the profitability of a business.

EXAMPLES -:

1. A bike is sold for Rs. 36,500 with a profit of 15%. What is the cost price of the bike?

A. Rs. 31,760

B. Rs. 31,250

C. Rs. 31,525

D. Rs. 32,500

Solution: Let the cost price of the bike be x. Selling price = Cost price + Profit 36,500 = x + 0.15x 36,500 = 1.15x x = 31,760 Therefore, the cost price of the bike is Rs. 31,760.

Answer: A.

2. A student got 68% marks in an exam. What is his percentage score if the maximum marks are 800?

A. 544

B. 544%

C. 54.4%

D. 540

Solution: Percentage score = (Marks obtained / Maximum marks) x 100 Percentage score = (68 / 800) x 100 Percentage score = 8.5% Therefore, the student's percentage score is 54.4%.

Answer: C.

3. In a class of 50 students, 30% are girls. How many boys are there in the class?

A. 35

B. 15

C. 20

D. 30

Solution: Number of girls = 30% of 50 = 0.3 x 50 = 15 Number of boys = Total number of students - Number of girls Number of boys = 50 - 15 = 35 Therefore, there are 35 boys in the class. Answer: A.

4. The price of a product is increased by 20%. By what percent should the price be decreased to get back to the original price?

   A. 20%

   B. 16.67%

   C. 25%

   D. 18%

   Solution: Let the original price of the product be x. New price = Original price + 20% of original price New price = x + 0.2x New price = 1.2x To get back to the original price, the new price should be reduced by: Percent decrease = (Amount of decrease / Original price) x 100 Percent decrease = ((1.2x - x) / x) x 100 Percent decrease = (0.2x / x) x 100 Percent decrease = 20% Therefore, the price should be decreased by 20% to get back to the original price. Answer: A.

5. The population of a town increased from 25,000 to 30,000 in 5 years. What is the percentage increase in population?

   A. 16%

   B. 18%

   C. 20%

   D. 25%

   Solution: Population increase = Final population - Initial population Population increase = 30,000 - 25,000 = 5,000 Percentage increase = (Population increase / Initial population) x 100 Percentage increase = (5,000 / 25,000) x 100 Percentage increase = 20% Therefore, the percentage increase in population is 20%.

   Answer: C.

6. A shopkeeper marks up the price of a product by 25% and then offers a discount of 20%. What is the net percent increase or decrease in the price of the product?

   A. 5% increase

   B. 5% decrease

   C. 4% increase

   D. 4% decrease

   Solution: Let the original price of the product be x. Marked up price = Original price + 25% of original price Marked up price = x + 0.25x Marked up price = 1.25x Discounted price = Marked up price - 20% of marked up price Discounted price = 1.25x - 0.2(1.25x) Discounted price = 1.25x - 0.25x Discounted price = x Net percent change = ((Discounted price - Original price) / Original price) x 100 Net percent change = ((x - x) / x) x 100 Net percent change = 0% Therefore, there is no net change in the price of the product. Answer: B.

7. A fruit seller sold apples at the rate of 5 for Rs. 25 and incurred a loss of 20%. At what rate should he sell apples to earn a profit of 20%?

   A. Rs. 6 per apple

   B. Rs. 7.50 per apple

   C. Rs. 6.25 per apple

   D. Rs. 8 per apple

   Solution: Cost price of 5 apples = Rs. 25 Cost price of 1 apple = Rs. 25/5 = Rs. 5 Loss percent = 20% Selling price = Cost price - Loss Selling price = 5 - 0.2(5) Selling price = Rs. 4 To earn a profit of 20%, the selling price should be: Selling price = Cost price + Profit Selling price = 5 + 0.2(5) Selling price = Rs. 6 Therefore, the fruit seller should sell apples at the rate of Rs. 6 per apple to earn a profit of 20%.

   Answer: A.

8. A discount of 20% on the marked price of a product gives a profit of 25%. What is the ratio of the cost price to the marked price of the product?

   A. 4:5

   B. 3:5

   C. 2:5

   D. 1:5

   Solution: Let the marked price of the product be x. Discounted price = Marked price - 20% of marked price Discounted price = x - 0.2x Discounted price = 0.8x Profit percent = 25% Cost price = (100 / (100 + Profit percent)) x Selling price Cost price = (100 / 125) x 0.8x Cost price = 0.64x Ratio of cost price to marked price = Cost price / Marked price Ratio of cost price to marked price = 0.64x / x Ratio of cost price to marked price = 0.64 Therefore, the ratio of the cost price to the marked price of the product is 4:5.

   Answer: A.

9. A book is sold for Rs. 225 after allowing a discount of 10%. What is the marked price of the book?

   A. Rs. 250

   B. Rs. 275

   C. Rs. 200

   D. Rs. 245

   Solution: Let the marked price of the book be x. Discount percent = 10% Selling price = Marked price - Discount Selling price = x - 0.1x Selling price = 0.9x Selling price = Rs. 225 0.9x = 225 x = 250 Therefore, the marked price of the book is Rs. 250.

   Answer : A.

10. A man sold an article for Rs. 300 and gained as much percent as the cost price of the article. What is the cost price of the article?

A. Rs. 100

B. Rs. 150

C. Rs. 200

D. Rs. 250

Solution: Let the cost price of the article be x. Profit percent = Cost price Selling price = Cost price + Profit Selling price = x + x Selling price = 2x Selling price = Rs. 300 2x = 300 x = 150 Therefore, the cost price of the article is Rs. 150.

Answer: B.

Contents

SIMPLE INTEREST AND COMPOUND INTEREST

Simple Interest: Simple interest is a type of interest that is calculated on the principal amount borrowed or invested over a period of time at a certain rate. The interest is calculated only on the principal amount, and not on the interest earned during previous periods. The formula for calculating simple interest is as follows:

Simple Interest = (P x R x T) / 100

Where P is the principal amount, R is the rate of interest, and T is the time period.

Compound Interest: Compound interest is a type of interest where the interest is calculated on the principal amount as well as on the interest earned during previous periods. This means that the interest earned during previous periods is added to the principal amount, and the interest is then calculated on the new principal amount. The formula for calculating compound interest is as follows:

Compound Interest = P x (1 + R/100) ^ T - P

Where P is the principal amount, R is the rate of interest, and T is the time period. The expression (1 + R/100) ^ T is the compound interest factor, which is multiplied by the principal amount to calculate the compound interest earned over the time period T.

IMPORTANT FORMULAS IN SIMPLE INTEREST AND COMPOUND INTEREST:

Important Formulas in Simple Interest:

1. Simple Interest = (P x R x T) / 100
2. Principal (P) = (100 x SI) / (R x T)
3. Rate (R) = (100 x SI) / (P x T)
4. Time (T) = (100 x SI) / (P x R)

5. Amount (A) = P + SI

Important Formulas in Compound Interest:

1. Compound Interest = P x (1 + R/100) ^ T - P
2. Amount (A) = P x (1 + R/100) ^ T
3. Principal (P) = A / (1 + R/100) ^ T
4. Rate (R) = {(A/P) ^ (1/T) - 1} x 100
5. Time (T) = log (A/P) / log (1 + R/100)

Where P is the principal amount, R is the rate of interest, T is the time period, SI is the simple interest, and A is the amount after compound interest.

EXAMPLES -:

1. A sum of money doubles itself in 5 years at a certain rate of simple interest. What is the rate of interest?

   A. 10%

   B. 15%

   C. 20%

   D. 25%

   Answer: C

   Solution: Let the sum of money be x. After 5 years, the amount is 2x. Simple Interest = Amount - Principal SI = 2x - x = x SI = (P x R x T) / 100 x =

(x x R x 5) / 100 R = (100 x x) / (x x 5) R = 20% Therefore, the rate of interest is 20%.

2. A sum of Rs. 5000 is invested at a certain rate of interest for 3 years. If the interest is compounded annually, what is the amount after 3 years?

   A. Rs. 6050

   B. Rs. 6655

   C. Rs. 7582

   D. Rs. 8035

   Answer: C

   Solution: P = Rs. 5000 R = ? T = 3 years Compound Interest = P x (1 + R/100) ^ T - P Amount = P + CI Amount = 5000 x (1 + R/100) ^ 3 CI = Amount - P CI = 5000 x [(1 + R/100) ^ 3 - 1] Therefore, 5000 x [(1 + R/100) ^ 3 - 1] = 5000 x (1 + R/100) ^ 3 - 5000 Solving the equation, we get R = 10% Therefore, the amount after 3 years is 5000 x (1 + 10/100) ^ 3 = Rs. 7582.

3. The simple interest on a sum of money for 2 years is Rs. 320. If the rate of interest is increased by 4%, what will be the new simple interest?

   A. Rs. 332.80

   B. Rs. 345.60

   C. Rs. 358.40

   D. Rs. 371.20

   Answer: B

   Solution: SI = P x R x T / 100 320 = P x R x 2 / 100 PR = 16000 Let the new rate of interest be (R + 4)% New SI = P x (R + 4) x 2 / 100 New SI = 320 x (R + 4) / R 320 x (R + 4) / R = 320 + (320 x 4) / 100 Solving the equation, we get R = 20% New SI = P x 24 x 2 / 100 New SI = Rs. 345.60 Therefore, the new simple interest is Rs. 345.60.

4. A sum of money becomes 3 times itself in 5 years at a certain rate of compound interest. What is the rate of interest?

   A. 50%

   B. 100%

   C. 150%

   D. 200%

   Answer: B

   Solution: Let the sum of money be x. After 5 years, the amount is 3x. Compound Interest = Amount - Principal 3x - x = 2x Amount = P x (1 + R/100) ^ T 3x = x x (1 + R/100) ^ 5

   Taking the fifth root on both sides, we get: (1 + R/100) = 3^(1/5) 1 + R/100 = 1.2457 R/100 = 0.2457 R = 24.57% Therefore, the rate of interest is 100%.

5. A man borrows Rs. 6000 at 10% per annum simple interest. If he pays Rs. 2400 after 3 years, how much amount does he still owe to the lender?

   A. Rs. 1400

   B. Rs. 1600

   C. Rs. 1800

   D. Rs. 2000

   Answer: A

   Solution: P = Rs. 6000 R = 10% T = 3 years Simple Interest = (P x R x T) / 100 SI = (6000 x 10 x 3) / 100 SI = Rs. 1800 Amount to be paid after 3 years = Principal + SI Amount to be paid after 3 years = 6000 + 1800 Amount to be paid after 3 years = Rs. 7800 Amount still owed to the lender = Amount to be paid - Amount paid Amount still owed to the lender = 7800 - 2400 Amount still owed to the lender = Rs. 5400 Therefore, the amount still owed to the lender is Rs. 1400.

6. The compound interest on a sum of money for 2 years at 20% per annum is Rs. 352. What is the sum?

   A. Rs. 800

   B. Rs. 900

   C. Rs. 1000

   D. Rs. 1100

   Answer: C

   Solution: Let the sum of money be x. Amount = P x (1 + R/100) ^ T Amount = x x (1 + 20/100) ^ 2 CI = Amount - P CI = x x [(1 + 20/100) ^ 2 - 1] 352 = x x 0.44 x = Rs. 1000 Therefore, the sum of money is Rs. 1000.

7. A sum of money becomes Rs. 8000 in 2 years at a certain rate of interest. If the interest is compounded half-yearly, what is the rate of interest?

   A. 12.5%

   B. 15%

   C. 16.66%

   D. 18.75%

   Answer: A

   Solution: Let the sum of money be x. Amount = P x (1 + R/200) ^ 4 8000 = x x (1 + R/200) ^ 4 (1 + R/200) ^ 4 = 2 1 + R/200 = 2^(1/4) R/200 = 0.1892 R = 37.84% Therefore, the rate of interest is 2 x 37.84 = 75.68% per annum. The rate of interest compounded half-yearly is 75.68 / 2 = 37.84% per half-year. Therefore, the rate of interest is 12.5%.

8. A man invests a certain sum of money at 8% per annum compound interest. If he gets Rs. 3312 after 2 years, what was the sum invested?

   A. Rs. 2500

   B. Rs. 3000

C. Rs. 3500

D. Rs. 4000

Answer: B

Solution: Let the sum of money be x Amount = P x (1 + R/100) ^ T 3312 = x x (1 + 8/100) ^ 2 x = 3312 / 1.1664 x = Rs. 2841.17 (approx.) Therefore, the sum invested is Rs. 3000.

9. A sum of money amounts to Rs. 7250 in 2 years and Rs. 8320 in 3 years at the same rate of interest. Find the sum.
   A. Rs. 4500
   B. Rs. 4600
   C. Rs. 4700
   D. Rs. 4800

   Answer: D Solution: Let the sum be x and the rate of interest be R. Amount = P + SI 7250 = x + (x x R x 2/100) 8320 = x + (x x R x 3/100) Solving the above equations, we get x = Rs. 4800 Therefore, the sum is Rs. 4800.

10. A sum of money becomes Rs. 15000 in 3 years at a certain rate of interest. If the interest is compounded annually, what is the sum?
    A. Rs. 10000
    B. Rs. 12000
    C. Rs. 12500
    D. Rs. 13000
    Answer: C
    Solution: Let the sum of money be x. Amount = P x (1 + R/100) ^ T 15000 = x x (1 + R/100) ^ 3 x = 15000 / (1 + R/100) ^ 3 Since the interest is compounded annually, the formula for compound interest is: Amount = P x (1 + R/100) ^ T 15000 = x x (1 + R/100) ^ 3 x = 15000 / (1 + R/100) ^ 3 x = Rs. 12500 Therefore, the sum of money is Rs. 12500.

Contents

RATIO AND PROPORTION

Ratio and proportion are two concepts that are commonly used in quantitative aptitude.

Ratio: A ratio is a mathematical comparison of two or more quantities of the same type. It is expressed as a fraction, with the numerator representing the first quantity and the denominator representing the second quantity. For example, if there are 5 boys and 10 girls in a class, the ratio of boys to girls is 5:10 or simplified as 1:2.

Proportion: A proportion is an equation that states that two or more ratios are equal. For example, if 2:3 is equivalent to 4:6, we can write it as a proportion: 2:3 = 4:6. In this proportion, the first ratio is called the "antecedent" and the second ratio is called the "consequent."

Proportions are used to solve problems that involve unknown quantities. For example, if we know that 2:3 is equivalent to 4:x, we can set up a proportion and solve for x.

These concepts are important in a wide range of quantitative aptitude problems, including those related to finance, geometry, and statistics.

SOME IMPORTANT FORMULAS RELATED TO RATIO AND PROPORTION:

1. Ratio: The ratio of two quantities a and b is expressed as a:b or a/b.

2. Proportion: If a/b = c/d, then we can write it as a:b::c:d, where a and d are called the "extremes," and b and c are called the "means."
3. Mean proportional: If a/b = b/c, then b is called the mean proportional between a and c.
4. Third proportional: If a/b = c/d, then d is called the third proportional to a and c.
5. Fourth proportional: If a/b = c/d, then b is called the fourth proportional to a, c, and d.
6. Componendo and dividendo: If a/b = c/d, then (a+b)/(a-b) = (c+d)/(c-d), where a, b, c, and d are positive numbers.
7. Duplicate ratio: If a/b = c/d, then (a^2)/(b^2) = (c^2)/(d^2).
8. Triplicate ratio: If a/b = c/d, then (a^3)/(b^3) = (c^3)/(d^3).
9. Inverse ratio: If a/b = c/d, then b/a = d/c.
10. Continued proportion: If a/b = b/c = c/d = k, then a, b, c, and d are said to be in continued proportion.

These formulas are commonly used to solve problems related to ratio and proportion in quantitative aptitude. It is important to understand the concepts behind these formulas and practice applying them to various types of problems.

EXAMPLES:-

1) If 2:3 is equivalent to 10:x, what is the value of x?

A. 5

B. 7.5

C. 15

D. 20

Answer: C. 15

Solution:

We can set up a proportion: 2/3 = 10/x

Cross-multiplying, we get: 2x = 30

Dividing both sides by 2, we get: x = 15

2) The ratio of boys to girls in a class is 3:4. If there are 24 girls in the class, how many boys are there?

A. 12

B. 18

C. 32

D. 48

Answer: B. 18

Solution:

We can use the given ratio to find the number of boys:

Let the number of boys be 3x.

Then the number of girls is 4x.

We are given that there are 24 girls, so we can set up an equation: 4x = 24

Solving for x, we get: x = 6

Therefore, the number of boys is 3x = 18.

3) If 5x + 4y = 44 and x:y = 2:3, what is the value of x?

A. 4

B. 8

C. 10

D. 12

Answer: A. 4

Solution:

We can use the given ratio to express y in terms of x:

y = (3/2)x

Substituting this into the first equation, we get:

5x + 4(3/2)x = 44

Simplifying, we get:

13x = 44

Dividing both sides by 13, we get:

x = 4

4) If the ratio of the areas of two similar triangles is 16:25, what is the ratio of their corresponding sides?

A. 4:5

B. 5:4

C. 16:25

D. 25:16

Answer: A. 4:5

Solution:

The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides. Therefore, if the ratio of the areas is 16:25, then the ratio of the corresponding sides is the square root of 16:25, which is 4:5.

5) If a:b = 2:3 and b:c = 4:5, what is the value of a:c?

A. 4:5

B. 8:15

C. 16:25

D. 32:45

Answer: B. 8:15

Solution:

We can use the given ratios to find the value of b:

b = (3/2)a (from a:b = 2:3)

b = (4/5)c (from b:c = 4:5)

Equating these two expressions for b, we get:

(3/2)a = (4/5)c

Solving for a/c, we get:

a/c = (4/5) x (2/3) = 8/15

6) If 20 men can do a piece of work in 12 days, how many days will 15 men take to do the same work?

A. 12

B. 15

C. 16

D. 18

Answer: D. 18

Solution:

Let the amount of work to be done be 1 unit. Then, the rate of work of 1 man is 1/(2012) = 1/240.

If 20 men can do the work in 12 days, then the total work done is 2012 = 240 man-days.

To find the number of days it will take 15 men to do the same work, we can set up a proportion:

20 men * 12 days = 15 men * x days

Solving for x, we get:

x = (20*12)/15 = 16

Therefore, 15 men can do the work in 16 days.

7) If x:y = 3:4 and y:z = 5:6, what is the value of x:y:z?

A. 15:20:24

B. 9:12:15

C. 12:15:18

D. 18:24:30

Answer: D. 18:24:30

Solution:

We can use the given ratios to find the value of x, y, and z:

y = (4/3)x (from x:y = 3:4)

z = (6/5)y (from y:z = 5:6)

Substituting for y in terms of x and z in terms of y, we get:

z = (6/5)(4/3)x = (8/5)x

Therefore, x:y:z = 3:4:(8/5) = 15:20:24.

8) A sum of money is divided among A, B, and C in the ratio of 3:4:5. If B receives $600, what is the total sum of money?

A. $1,200

B. $1,500

C. $1,800

D. $2,000

Answer: C. $1,800

Solution:

We can use the given ratio to find the amount of money received by A and C:
A:B:C = 3:4:5
Let the total sum of money be x.
Then B receives (4/12)x = (1/3)x.
If B receives $600, then we can set up an equation:
(1/3)x = 600
Solving for x, we get:
x = $1,800
Therefore, the total sum of money is $1,800, and A and C receive $540 and $900, respectively.

9) If 3x + 4y = 18 and x:y = 2:3, what is the value of y?

A. 2

B. 3

C. 4

D. 5

Answer: D. 5

Solution:

We can use the given ratio to express x in terms of y:
x = (2/3)y

Substituting this into the first equation, we get:
3(2/3)y + 4y = 18
Simplifying, we get:
6y + 4y = 18
Solving for y, we get:
y = 5

10) If a:b = 7:9 and b:c = 4:5, what is the value of a:b:c?

A. 28:36:45

B. 28:35:45

C. 35:45:56

D. 36:45:56

Answer: B. 28:35:45

Solution:

We can use the given ratios to find the value of a, b, and c:
b = (9/7)a (from a:b =7:9)
c = (5/4)b (from b:c = 4:5)
Substituting for b in terms of a and c in terms of b, we get:
b = (7/9)a
c = (5/4)(7/9)a = (35/36)a

Therefore, a:b:c = 7:9:(35/36) = 28:35:45.

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ALLIGATIONS AND MIXTURES

In quantitative aptitude, the terms "alligations" and "mixtures" refer to mathematical concepts related to the mixing of different substances or components.

"Alligation" is a technique used to determine the proportion of different components in a mixture when the final mixture is given along with the individual components. This technique involves finding a weighted average of the component concentrations to arrive at the desired ratio of the components in the mixture.

For example, if a mixture contains two components A and B in the ratio of 2:3, and the final mixture contains 10 units of the mixture, then the weight of component A in the mixture is (2/5) x 10 = 4 units, and the weight of component B in the mixture is (3/5) x 10 = 6 units.

"Mixture" refers to the combination of two or more substances in a fixed proportion. In quantitative aptitude, problems related to mixtures typically involve finding the ratio of different components in a mixture, or finding the amount of one component that needs to be added to a given mixture to achieve a desired ratio.

For example, if a mixture contains 40% salt and 60% sugar, and we want to make a new mixture with 50% salt, we can calculate the amount of salt we need to add to the existing mixture to achieve the desired ratio. This involves finding the ratio of salt to the total mixture in the existing mixture, and then using this ratio to calculate the amount of salt needed to achieve the desired ratio.

IMPORTANT FORMULAS IN ALLIGATIONS AND MIXTURES

Here are some important formulas and concepts related to alligations and mixtures in quantitative aptitude:

1. Alligation rule: This is used to find the proportion of two or more ingredients in a mixture. If two ingredients A and B are mixed in the ratio of x:y, then the mean price of the mixture (M) is given by:

M = (y/(x+y)) * A + (x/(x+y)) * B

2. Rule of allegation: This is used to find the amount of two or more ingredients to be mixed to get a desired proportion. If two ingredients A and B are mixed to get a mixture of M, and the ratio of A and B in the mixture is given as x:y, then the quantity of A and B to be taken are:

Quantity of A = (y/(x+y)) * M Quantity of B = (x/(x+y)) * M

3. Mixtures with more than two components: When there are more than two components in a mixture, the alligation can be done in two stages. For example, if there are three ingredients A, B, and C mixed in the ratio of x:y:z, and we want to find the ratio of A and B in the final mixture, then we can do the following:

- First, find the ratio of A and B in the mixture of A and B only using the alligation rule.
- Next, use this ratio along with the ratio of C to find the final ratio of A and B in the mixture using the alligation rule again.

4. Complementary mixture: A complementary mixture is one where two or more mixtures are mixed to get a desired proportion. For example, if there are two mixtures A and B with ratios x:y and p:q respectively, and we want to mix them to get a final mixture with ratio a:b, then the quantities of A and B required are given by:

Quantity of A = (bq/(ay + bq)) * Total quantity of mixture Quantity of B = (ay/(ay + bq)) * Total quantity of mixture

These are some of the important formulas and concepts related to alligations and mixtures in quantitative aptitude.

EXAMPLES -:

1. A vessel contains a mixture of milk and water in the ratio of 5:3. If 10 liters of milk is added to the mixture, the ratio becomes 7:3. What was the initial quantity of the mixture?

   a. 18 liters

   b. 24 liters

   c. 30 liters

   d. 36 liters

Solution: Let the initial quantity of the mixture be x liters. The ratio of milk to water in the initial mixture is 5:3, so the initial quantity of milk is (5/8) * x and the initial quantity of water is (3/8) * x. After adding 10 liters of milk, the ratio becomes 7:3, which means that the final quantity of milk is (7/10) * (x + 10) and the final quantity of water is (3/10) * (x + 10). Setting up an alligation diagram for milk:

5 2 x 10 2 7

The ratio of milk to the total mixture in the final mixture is 7/10, which means that the initial ratio is 2/5. Using the alligation rule, we get:

(10 - x)/(x + 10) = 2/5 Solving for x, we get x = 30 liters.

Therefore, the initial quantity of the mixture was 30 liters. Answer: (c) 30 liters.

2. A mixture contains milk and water in the ratio of 5:3. If 6 liters of water is added to the mixture, the ratio becomes 5:7. What was the initial quantity of the mixture?

   a. 24 liters

   b. 30 liters

   c. 36 liters

   d. 40 liters

Solution: Let the initial quantity of the mixture be x liters. The ratio of milk to water in the initial mixture is 5:3, so the initial quantity of milk is (5/8) * x and the initial quantity of water is (3/8) * x. After adding 6 liters of water, the ratio becomes 5:7, which means that the final quantity of milk is (5/12) * (x + 6) and the final quantity of water is (7/12) * (x + 6). Setting up an alligation diagram for water:

3 4 x 6 4 7

The ratio of water to the total mixture in the final mixture is 7/12, which means that the initial ratio is 4/5. Using the alligation rule, we get:

(6 - x)/(x) = 4/5 Solving for x, we get x = 24 liters.

Therefore, the initial quantity of the mixture was 24 liters. Answer: (a) 24 liters.

3. A container has 20 liters of a mixture of milk and water in the ratio of 3:2. How much water should be added to make the ratio 2:3?

   a. 8 liters

   b. 10 liters

   c. 12 liters

   d. 15 liters

Solution: Let x be the amount of water that needs to be added. The initial quantity of milk is (3/5) * 20 = 12 liters and the initial quantity of water is (2/5) * 20 = 8 liters. After adding x liters of water, the quantity of water becomes (8 + x) liters and the quantity of milk remains 12 liters. Setting up an alligation diagram for water:

2 3 8 x 3 2

The ratio of water to the total mixture in the final mixture is 3/5, which means that the initial ratio is 2/5. Using the alligation rule, we get:

(x - 8)/(20) = 2/5 Solving for x, we get x = 12 liters.

Therefore, 12 liters of water should be added to make the ratio 2:3. Answer: (c) 12 liters.

4. A mixture contains alcohol and water in the ratio of 2:3. If 5 liters of alcohol is added to the mixture, the ratio becomes 4:5. What was the initial quantity of the mixture?

   a. 25 liters

   b. 30 liters

   c. 35 liters

   d. 40 liters

Solution: Let the initial quantity of the mixture be x liters. The ratio of alcohol to water in the initial mixture is 2:3, so the initial quantity of alcohol is (2/5) * x and the initial quantity of water is (3/5) * x. After adding 5 liters of alcohol, the ratio becomes 4:5, which means that the final quantity of alcohol is (4/9) * (x + 5) and the final quantity of water is (5/9) * (x + 5). Setting up an alligation diagram for alcohol:

2 1 x 5 3 4

The ratio of alcohol to the total mixture in the final mixture is 4/9, which means that the initial ratio is 1/3. Using the alligation rule, we get:

(5 - x)/(x) = 1/3 Solving for x, we get x = 25 liters.

Therefore, the initial quantity of the mixture was 25 liters. Answer: (a) 25 liters.

5. A vessel contains a mixture of milk and water in the ratio of 4:3. If 6 liters of the mixture is removed and replaced with water, the ratio becomes 2:3. What was the initial quantity of the mixture?

   a. 18 liters

   b. 24 liters

   c. 30 liters

   d. 36 liters

Solution: Let the initial quantity of the mixture be x liters. The ratio of milk to water in the initial mixture is 4:3, so the initial quantity of milk is (4/7) * x and

the initial quantity of water is (3/7) * x. After 6 liters of the mixture is removed and replaced with water, the quantity of water becomes (3/7) * (x - 6) + 6 and the quantity of milk remains (4/7) * x. Setting up an alligation diagram for water:

3 5 x - 6 6 5 2

The ratio of water to the total mixture in the final mixture is 3/5, which means that the initial ratio is 2/5. Using the alligation rule, we get:

(6 - (3/7) * x)/(x) = 2/5 Solving for x, we get x = 30 liters.

Therefore, the initial quantity of the mixture was 30 liters. Answer: (c) 30 liters.

6. A mixture of alcohol and water contains alcohol and water in the ratio of 2:3. If 20 liters of the mixture is removed and replaced with water, the ratio becomes 1:2. What was the initial quantity of the mixture?

   a. 60 liters

   b. 80 liters

   c. 100 liters

   d. 120 liters

Solution: Let the initial quantity of the mixture be x liters. The ratio of alcohol to water in the initial mixture is 2:3, so the initial quantity of alcohol is (2/5) * x and the initial quantity of water is (3/5) * x. After 20 liters of the mixture is removed and replaced with water, the quantity of water becomes (3/5) * (x - 20) + 20 and the quantity of alcohol remains (2/5) * x. Setting up an alligation diagram for water:

3 1 x - 20 20 2 1

The ratio of water to the total mixture in the final mixture is 2/3, which means that the initial ratio is 1/3. Using the alligation rule, we get:

(20 - (3/5) * x)/(x) = 1/3 Solving for x, we get x = 100 liters.

Therefore, the initial quantity of the mixture was 100 liters.

Answer: (c) 100 liters.

7. A mixture of petrol and kerosene contains petrol and kerosene in the ratio of 3:2. If 10 liters of kerosene is added to the mixture, the ratio becomes 2:3. What was the initial quantity of the mixture?

   a. 30 liters

   b. 40 liters

   c. 50 liters

   d. 60 liters

Solution: Let the initial quantity of the mixture be x liters. The ratio of petrol to kerosene in the initial mixture is 3:2, so the initial quantity of petrol is (3/5) * x and the initial quantity of kerosene is (2/5) * x. After adding 10 liters of kerosene, the quantity of kerosene becomes (2/7) * (x + 10) and the quantity of petrol remains (3/5) * x. Setting up an alligation diagram for kerosene:

2 5 x 10 5 2

The ratio of kerosene to the total mixture in the final mixture is 5/7, which means that the initial ratio is 2/7. Using the alligation rule, we get:

(10 - (2/5) * x)/(x) = 2/7 Solving for x, we get x = 50 liters.

Therefore, the initial quantity of the mixture was 50 liters. Answer: (c) 50 liters.

8. A mixture of milk and water contains milk and water in the ratio of 5:2. If 4 liters of the mixture is removed and replaced with water, the ratio becomes 2:5. What was the initial quantity of the mixture?

   a. 20 liters

   b. 24 liters

   c. 28 liters

   d. 32 liters

Solution: Let the initial quantity of the mixture be x liters. The ratio of milk to water in the initial mixture is 5:2, so the initial quantity of milk is (5/7) * x and

the initial quantity of water is (2/7) * x. After 4 liters of the mixture is removed and replaced with water, the quantity of water becomes (2/7) * (x - 4) + 4 and the quantity of milk remains (5/7) * x. Setting up an alligation diagram for water:

2 5 x - 4 4 5 2

The ratio of water to the total mixture in the final mixture is 5/7, which means that the initial ratio is 2/7. Using the alligation rule, we get:

(4 - (2/7) * x)/(x) = 2/7 Solving for x, we get x = 28 liters.

Therefore, the initial quantity of the mixture was 28 liters. Answer: (c) 28 liters.

9. A mixture of sand and salt contains sand and salt in the ratio of 3:2. If 4 kg of sand is added to the mixture, the ratio becomes 5:4. What was the initial quantity of the mixture?

   a. 20 kg

   b. 24 kg

   c. 28 kg

   d. 32 kg

Solution: Let the initial quantity of the mixture be x kg. The ratio of sand to salt in the initial mixture is 3:2, so the initial quantity of sand is (3/5) * x and the initial quantity of salt is (2/5) * x. After 4 kg of sand is added, the quantity of sand becomes (3/8) * (x + 4) and the quantity of salt remains (2/5) * x. Setting up an alligation diagram for sand:

3 5 x x + 4 2 3

The ratio of sand to the total mixture in the final mixture is 3/8, which means that the initial ratio is 5/8. Using the alligation rule, we get:

(x + 4 - (3/5) * x)/(x) = 5/8 Solving for x, we get x = 20 kg.

Therefore, the initial quantity of the mixture was 20 kg.

Answer: (a) 20 kg.

10. A mixture of coffee and chicory contains coffee and chicory in the ratio of 3:2. If 2 kg of chicory is added to the mixture, the ratio becomes 3:4. What was the initial quantity of the mixture?

    a. 10 kg

    b. 12 kg

    c. 15 kg

    d. 20 kg

Solution: Let the initial quantity of the mixture be x kg. The ratio of coffee to chicory in the initial mixture is 3:2, so the initial quantity of coffee is (3/5) * x and the initial quantity of chicory is (2/5) * x. After 2 kg of chicory is added, the quantity of chicory becomes (2/7) * (x + 2) and the quantity of coffee remains (3/5) * x. Setting up an alligation diagram for chicory:

2 4 x x + 2 3 2

The ratio of chicory to the total mixture in the final mixture is 4/7, which means that the initial ratio is 3/7. Using the alligation rule, we get:

(x + 2 - (2/5) * x)/(x) = 3/7 Solving for x, we get x = 12 kg.

Therefore, the initial quantity of the mixture was 12 kg.

Answer: (b) 12 kg.

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AGES -:

Aptitude problems related to ages typically involve finding the present age of a person or the age of a person in the past or future given certain conditions. These problems may involve one or more people and can be solved using mathematical formulas and logical reasoning. In order to solve problems related to ages, one needs to be familiar with basic concepts of arithmetic, algebra and logic. Some common types of problems related to ages include finding the age of a person after a certain number of years, determining the age of a person at a particular point in time based on their birth year, and finding the ratio of ages of two or more people.

IMPORTANT FORMULAS IN AGES

Here are some important formulas related to ages in quantitative aptitude:

1. Age of a person = Current year - Year of birth
2. Age of a person n years from now = Current age + n
3. Age of a person n years ago = Current age - n
4. If the ratio of the ages of two persons is a:b, and the sum of their ages is S, then their individual ages can be calculated using the following formulas:

Person 1's age = (a / (a+b)) * S Person 2's age = (b / (a+b)) * S

5. If the difference between the ages of two persons is d years, and their ages are in the ratio of a:b, then their individual ages can be calculated using the following formulas:

Person 1's age = (d + (a-b))/2 Person 2's age = (d + (b-a))/2

6. If the age of a father is F years and the age of his son is S years, then the father's age when the son was born can be calculated using the formula:

Father's age when son was born = F - S

These formulas can be used to solve a variety of problems related to ages in quantitative aptitude.

EXAMPLES -:

1. The sum of the present ages of a father and his son is 66 years. Five years ago, the father's age was four times the age of his son. What are their present ages?

   a. Father is 48 years and son is 18 years

   b. Father is 42 years and son is 24 years

   c. Father is 36 years and son is 30 years

   d. Father is 30 years and son is 36 years

   Answer: b

   Solution: Let the father's present age be F and son's present age be S. From the given information, we have: F + S = 66 (Equation 1) F - 5 = 4(S - 5) (Equation 2) Solving these equations simultaneously, we get F = 42 and S = 24.

2. The sum of the present ages of a father and his son is 56 years. Four years ago, the father's age was three times the age of his son. What are their present ages?

   a. Father is 36 years and son is 20 years

b. Father is 40 years and son is 16 years

c. Father is 44 years and son is 12 years

d. Father is 48 years and son is 8 years

Answer: c

Solution: Let the father's present age be F and son's present age be S. From the given information, we have: F + S = 56 (Equation 1) F - 4 = 3(S - 4) (Equation 2) Solving these equations simultaneously, we get F = 44 and S = 12.

3. Ten years ago, the ratio of the ages of Ram and Shyam was 3:5. If the present age of Ram is 30 years, what is the present age of Shyam?

a. 50 years

b. 58 years c.

60 years

d. 68 years

Answer: b

Solution: Let Ram's age 10 years ago be 3x and Shyam's age 10 years ago be 5x. Then we have: 3x + 10 = Ram's present age = 30 x = 6 Therefore, Shyam's age 10 years ago was 30, and his present age is 5x + 10 = 40.

4. The present age of a mother is three times the present age of her daughter. If the daughter is 10 years old now, how many years ago was the mother's age twice the daughter's age?

a. 4 years ago

b. 6 years ago

c. 8 years ago

d. 10 years ago

Answer: d

Solution: Let the present age of the mother be M and the present age of the daughter be D. From the given information, we have: M = 3D D = 10 We need to find the number of years ago when the mother's age was twice the daughter's age. Let x be the number of years ago when this was the case. Then we have: M - x = 2(D - x) Substituting M = 3D and D = 10, we get: 30 - x = 2(10 - x) Solving for x, we get x = 10 years ago.

5. The ratio of the ages of a father and his son is 5:3. After 10 years, the ratio of their ages will be 7:5. What are their present ages?

   a. Father is 40 years and son is 24 years

   b. Father is 35 years and son is 21 years

   c. Father is 45 years and son is 27 years

   d. Father is 50 years and son is 30 years

   Answer: a

   Solution: Let the present age of the father be F and the present age of the son be S. From the given information, we have: F/S = 5/3 (Equation 1) (F+10)/(S+10) = 7/5 (Equation 2) Solving these equations simultaneously, we get F = 40 and S = 24.

6. The ratio of the ages of a father and his son is 9:4. If the father is 54 years old, what is the age of his son?

   a. 24 years

   b. 18 years

   c. 16 years

   d. 12 years

   Answer: c

   Solution: Let the present age of the father be F and the present age of the son be S. From the given information, we have: F/S = 9/4 F = 54

Substituting F = 54 in the above equation, we get: 54/S = 9/4
Solving for S, we get S = 16.

7. The ages of three friends are in the ratio 3:5:7. If the sum of their ages is 90, what is the age of the youngest friend?

   a. 15 years

   b. 18 years

   c. 21 years

   d. 24 years

   Answer: a

   Solution: Let the ages of the three friends be 3x, 5x, and 7x. From the given information, we have: 3x + 5x + 7x = 90 Solving for x, we get x = 6. Therefore, the age of the youngest friend is 3x = 18.

8. A man is three times as old as his son. In 15 years, the man will be twice as old as his son. What are their present ages?

   a. Father is 45 years and son is 15 years

   b. Father is 42 years and son is 14 years

   c. Father is 48 years and son is 16 years

   d. Father is 51 years and son is 17 years

   Answer: b

   Solution: Let the present age of the son be S and the present age of the father be F. From the given information, we have: F = 3S (Equation 1) F+15 = 2(S+15) (Equation 2) Substituting Equation 1 in Equation 2, we get: 3S+15 = 2S+30 Solving for S, we get S = 15. Substituting S = 15 in Equation 1, we get F = 45.

9. A father is now three times as old as his daughter. After 6 years, he will be only twice as old as his daughter. What are their present ages?

   a. Father is 36 years and daughter is 12 years

b. Father is 42 years and daughter is 14 years

c. Father is 48 years and daughter is 16 years

d. Father is 54 years and daughter is 18 years

Answer: b

Solution: Let the present age of the daughter be D and the present age of the father be F. From the given information, we have: F = 3D (Equation 1) F+6 = 2(D+6) (Equation 2) Substituting Equation 1 in Equation 2, we get: 3D+6 = 2D+12 Solving for D, we get D = 6. Substituting D = 6 in Equation 1, we get F = 18.

10. The sum of the ages of a father and his son is 50. If the ratio of their ages is 7:3, what is the age of the father?

a. 35 years

b. 42 years

c. 45 years

d. 49 years

Answer: b

Solution: Let the present age of the father be F and the present age of the son be S. From the given information, we have: F+S = 50 F/S = 7/3 Solving these equations simultaneously, we get F = 42.

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PARTNERSHIP

In quantitative aptitude, a partnership refers to a business relationship between two or more individuals or entities who contribute capital, labor, or both, to operate and manage a business. The partnership may have a legal agreement defining the terms and conditions of the partnership, including the profit-sharing ratio and the roles and responsibilities of each partner.

In the context of quantitative aptitude, partnership problems typically involve calculating the share of profits each partner is entitled to receive based on their contribution to the business, the duration of their partnership, and other relevant factors. These problems often require the use of mathematical formulas and concepts such as ratios, percentages, and fractions.

SOME OF THE IMPORTANT FORMULAS USED IN PARTNERSHIP PROBLEMS:

1. Ratio of investments: The ratio of investments is determined by dividing the amount invested by each partner by the total amount invested by all partners.

Investment ratio of partner A = Amount invested by partner A / Total amount invested by all partners

2. Ratio of profit sharing: The ratio of profit sharing is determined by dividing the total profit by the agreed profit-sharing ratio.

Profit sharing ratio of partner A = Agreed profit-sharing ratio of partner A / Total profit-sharing ratio

3. Calculation of profits or losses: The profit or loss is calculated by subtracting the total expenses from the total income.

Profit or loss = Total income - Total expenses

4. Calculation of share of profits or losses: The share of profit or loss is calculated by multiplying the profit or loss by the profit-sharing ratio.

Share of profit or loss of partner A = Profit or loss x Profit-sharing ratio of partner A

5. Calculation of duration of partnership: The duration of partnership is calculated by dividing the investment made by a partner by their share of profit or loss.

Duration of partnership of partner A = Investment made by partner A / Share of profit or loss of partner A

These are some of the important formulas used in partnership problems in quantitative aptitude. It's important to understand these formulas and practice solving different types of partnership problems to improve your proficiency in this area.

EXAMPLES -:

1. A, B and C invested in a business in the ratio 2:3:5. If they earn a profit of $10,000, what is B's share in the profit?

   A) $2,000

   B) $3,000

   C) $4,000

   D) $5,000

Solution: The total ratio of investments is 2+3+5 = 10. B's investment ratio is 3/10. B's share in the profit = 3/10 x $10,000 = $3,000.

Therefore, the correct answer is option B) $3,000.

2. A and B invested in a business in the ratio 3:4. If they earn a profit of $2,400 and A's share is $900, what is the total profit?

   A) $1,600

   B) $2,000

   C) $3,200

   D) $3,600

Solution: The total ratio of investments is 3+4 = 7. A's investment ratio is 3/7. Let the total profit be x. A's share in the profit = 3/7 x $x = $900. Therefore, x = $2,100.

Thus, the correct answer is option D) $3,600.

3. A and B start a business with an investment of $4,000 and $6,000 respectively. If the total profit is $12,000 and A's share in the profit is $4,800, what is the ratio of time for which they invested their money?

   A) 1:1

   B) 2:3

   C) 3:2

   D) 4:3

Solution: Let the ratio of time for which A and B invested their money be x and y, respectively. A's share in the profit = (x/ (x+y)) x $12,000 = $4,800. Solving the equation, we get y/x = 3/2.

Therefore, the correct answer is option C) 3:2.

4. A and B invested in a business in the ratio 5:3. If they earned a profit of $1,800 and they decide to distribute the profit in the ratio of time for which they invested their money, what is B's share?

   A) $600

   B) $900

C) $1,200

D) $1,500

Solution: Let the ratio of time for which A and B invested their money be 5x and 3x, respectively. A's share in the profit = (5x/ (5x+3x)) x $1,800 = $1,080. B's share in the profit = (3x/ (5x+3x)) x $1,800 = $720.

Therefore, the correct answer is option A) $600.

5. A, B, and C invested in a business in the ratio 2:3:5. If they earned a profit of $20,000 and C's share is $10,000, what is the total investment?

   A) $15,000

   B) $25,000

   C) $35,000

   D) $45,000

Solution: The total ratio of investments is 2+3+5 = 10. C's investment ratio is 5/10. C's share in the profit = 5/10 x $20,000 = $10,000. Therefore, the total investment = ($10,000 x 10)/5 = $20,000. Thus, the correct answer is option B) $25,000.

6. A, B, and C invested in a business in the ratio 3:4:5. If the total profit is $12,000, what is A's share in the profit?

   A) $2,400

   B) $3,200

   C) $3,600

   D) $4,800

Solution: The total ratio of investments is 3+4+5 = 12. A's investment ratio is 3/12. A's share in the profit = 3/12 x $12,000 = $3,000. Therefore, the correct answer is option A) $2,400.

7. A and B invested in a business in the ratio 4:5. If they earn a profit of $1,800 and they decide to distribute the profit in the ratio of their investments, what is B's share?

   A) $600

   B) $800

   C) $900

   D) $1,000

Solution: The total ratio of investments is 4+5 = 9. A's investment ratio is 4/9. B's investment ratio is 5/9. A's share in the profit = 4/9 x $1,800 = $800. B's share in the profit = 5/9 x $1,800 = $1,000. Therefore, the correct answer is option D) $1,000.

8. A and B invested in a business in the ratio 3:2. If they earn a profit of $1,500 and they decide to distribute the profit in the ratio of their investments, what is A's share?

   A) $900

   B) $1,000

   C) $1,200

   D) $1,300

Solution: The total ratio of investments is 3+2 = 5. A's investment ratio is 3/5. B's investment ratio is 2/5. A's share in the profit = 3/5 x $1,500 = $900. Therefore, the correct answer is option A) $900.

9. A and B invested in a business in the ratio 2:3. After 6 months, A withdrew his investment. If they earn a profit of $2,400, what is B's share in the profit?

   A) $1,000

   B) $1,200

   C) $1,500

D) $1,800

Solution: Let A invest for 6 months and B invest for the entire year. The total investment for the year = 2x + 3x = 5x. A's investment for the year = 2x for 6 months = x. B's investment for the year = 3x for 12 months = 3x. A's share in the profit = (x/5x) x $2,400 = $480. B's share in the profit = (4x/5x) x $2,400 = $1,920. Therefore, the correct answer is option D) $1,800.

10. A and B invested in a business in the ratio 5:3. After 8 months, A withdrew his investment. If they earn a profit of $2,400, what is B's share in the profit?

    A) $1,200

    B) $1,400

    C) $1,800

    D) $2,000

Solution: Let A invest for 8 months and B invest for the entire year. The total investment for the year = 5x + 3x = 8x. A's investment for the year = 5x for 8 months = (5/12) x 8x = (20/3) x. B's investment for the year = 3x for 12 months = 3x. A's share in the profit = ((20/3)x/8x) x $2,400 = $1,000. B's share in the profit = ((16/3)x/8x) x $2,400 = $1,200. Therefore, the correct answer is option B) $1,200.

I hope these MCQ questions, options, solutions, and explanations were helpful for you to understand the concept of partnership in quantitative aptitude.

Contents

TIME AND WORK

Time and work is a concept in quantitative aptitude that deals with the amount of work done by a person or a group of persons in a specific amount of time. It involves finding the time taken to complete a particular task or finding the efficiency of a person or a group of persons in completing a task. The concept of time and work is commonly used in various fields such as construction, manufacturing, and project management, where the time taken to complete a task is a crucial factor.

SOME IMPORTANT FORMULAS IN TIME AND WORK:

1. Work Done = Time × Efficiency This formula states that the amount of work done is equal to the time taken to complete the work multiplied by the efficiency of the person or group of persons doing the work.
2. Efficiency = Work Done ÷ Time This formula states that the efficiency of a person or group of persons is equal to the amount of work done divided by the time taken to complete the work.
3. If A can do a piece of work in x days, then A's one day's work = 1/x This formula states that if A can do a particular task in x days, then A's work in one day is equal to 1/x of the total work.
4. If A can do a piece of work in x days and B can do the same work in y days, then A and B together can do the work in (xy / x+y) days. This formula is used to find the time taken by A and B working together to complete a task, where A can do the work in x days and B can do the same work in y days.
5. If A can do a piece of work in x days and B in y days, then the work done by both in one day is (x+y)/(xy) This formula is used to find the amount

of work done by A and B together in one day, where A can do the work in x days and B can do the same work in y days.

These formulas are crucial in solving problems related to time and work in quantitative aptitude.

EXAMPLES -:

1. A can complete a work in 6 days and B can complete the same work in 8 days. In how many days will they together complete the same work?

   A) 2.4 days

   B) 3 days

   C) 3.2 days

   D) 3.6 days

Solution: Let the total work to be completed be W. A's efficiency = 1/6, B's efficiency = 1/8 Efficiency of A and B together = (1/6) + (1/8) = 7/24 Therefore, time taken by A and B together to complete the work = W / (7/24) = (24/7)W Substituting W = 1, we get (24/7) days ≈ 3.43 days Therefore, the correct answer is option C) 3.2 days.

2. A can do a piece of work in 10 days and B can do the same work in 15 days. They work together for 2 days, after which A leaves. In how many more days will B complete the remaining work?

   A) 4

   B) 5

   C) 6

   D) 7

Solution: Let the total work to be completed be W. A's efficiency = 1/10, B's efficiency = 1/15 Efficiency of A and B together = (1/10) + (1/15) = 1/6 In 2

days, A and B together complete 2 x (1/6) = 1/3 of the work. The remaining work = 1 - 1/3 = 2/3 of the work. Efficiency of B alone = (1/15) - (1/10) = 1/30 Therefore, time taken by B alone to complete the remaining work = (2/3) / (1/30) = 20/3 days Subtracting 2 days already worked by A and B, we get 20/3 - 2 = 14/3 days ≈ 4.67 days Therefore, the correct answer is option A) 4.

3. A can do a piece of work in 6 days and B in 12 days. With the help of C, they completed the work in 2 days. If they are paid a total of $360 for the work, what is C's share?

   A) $60

   B) $80

   C) $90

   D) $120

Solution: Let the total work to be completed be W. A's efficiency = 1/6, B's efficiency = 1/12, A and B's efficiency together = (1/6) + (1/12) = 1/4 Efficiency of A, B, and C together = (1/2) x (1/4) = 1/8 C's efficiency = (1/8) - (1/6) - (1/12) = 1/24 Let C's share of the money be x. Then, A's share = 2 x (1/6) x (360/(1/6 + 1/12 + 1/24)) = $120 B's share = 2 x (1/12) x (360/(1/6 + 1/12 + 1/24)) = $80 C's share = 2 x (1/24) x (360/(1/6 + 1/12 + 1/24)) = $60 Therefore, the correct answer is option A) $60.

4. A and B together can do a piece of work in 8 days. B and C together can do the same work in 12 days. If A, B, and C together work on the same piece of work, in how many days will they complete it?

   A) 4 days

   B) 5 days

   C) 6 days

   D) 7 days

Solution: Let the total work to be completed be W. Efficiency of A and B together = 1/8, efficiency of B and C together = 1/12 Efficiency of A, B, and C together = (efficiency of A and B together) + (efficiency of B and C together) - (efficiency of B) = (1/8) + (1/12) - (1/15) = 7/120 Therefore, time taken by A, B, and C together to complete the work = W / (7/120) = (120/7)W Substituting W = 1, we get (120/7) days ≈ 17.14 days Therefore, the correct answer is option D) 7 days.

5. A contractor undertakes to complete a work in 100 days and hires 20 workers. After 50 days, he finds that only 1/4th of the work has been completed. How many more workers does he need to complete the work on time?

   A) 10

   B) 15

   C) 20

   D) 25

Solution: Let the total work to be completed be W. Efficiency of 20 workers = 1/100, efficiency of 1 worker = 1/(20 x 100) = 1/2000 Efficiency of 20 workers in 50 days = (1/4) x (1/100) = 1/400 Work left to be completed after 50 days = 1 - 1/4 = 3/4 of the work. Therefore, the time taken by (20 + x) workers to complete the remaining work = (3/4) / ((20 + x) x (1/2000)) = 1500 / (20 + x) days We want this time to be 50 days so that the work is completed on time. Therefore, 1500 / (20 + x) = 50 Solving for x, we get x = 10 Therefore, the correct answer is option A) 10 workers.

6. A can do a piece of work in 20 days and B can do the same work in 25 days. They start working together but A leaves after some days and B completes the remaining work in 10 days. After how many days did A leave?

   A) 6

   B) 8

   C) 10

D) 12

Solution: Let the total work to be completed be W. Efficiency of A = 1/20, efficiency of B = 1/25 Efficiency of A and B together = (1/20) + (1/25) = 9/100 Let A leave after x days. Therefore, the work done by A in x days = x x (1/20) = x/20 The work done by B in (x + 10) days = (1 - x/20) x (9/100) x (x + 10) = 9(x + 10)/200 Therefore, the total work completed = work done by A + work done by B W = x/20 + 9(x + 10)/200 Simplifying, we get 20x + 180 = 9x + 90 Solving for x, we get x = 6 Therefore, A left after 6 days. Therefore, the correct answer is option A) 6.

7. A contractor undertakes to complete a work in 50 days and hires 20 workers. After 25 days, he finds that only 1/5th of the work has been completed. If he wants to complete the work on time, how many more workers does he need to hire?

   A) 10

   B) 20

   C) 25

   D) 30

Solution: Let the total work to be completed be W. Efficiency of 20 workers = 1/50, efficiency of 1 worker = 1/(20 x 50) = 1/1000 Efficiency of 20 workers in 25 days = (1/5) x (1/50) = 1/250 Work left to be completed after 25 days = 1 - 1/5 = 4/5 of the work. Let x be the number of additional workers required to complete the work on time. Therefore, the time taken by (20 + x) workers to complete the remaining work = (4/5) / ((20 + x) x (1/1000)) = 8000 / (20 + x) days We want this time to be 25 days so that the work is completed on time. Therefore, 8000 / (20 + x) = 25 Solving for x, we get x = 20 Therefore, the correct answer is option B) 20 workers.

8) A can complete a work in 24 days and B can complete the same work in 36 days. They start working together but A leaves after some days and B completes the remaining work in 12 days. After how many days did A leave?

A) 6

B) 8

C) 10

D) 12

Solution: Let the total work to be completed be W. Efficiency of A = 1/24, efficiency of B = 1/36 Efficiency of A and B together = (1/24) + (1/36) = 5/72 Let A leave after x days. Therefore, the work done by A in x days = x x (1/24) = x/24 The work done by B in (x + 12) days = (1 - x/24) x (5/72) x (x + 12) = 5(x + 12)/432 Therefore, the total work completed = work done by A + work done by B W = x/24 + 5(x + 12)/432 Simplifying, we get 36x + 180 = 5x + 180 Solving for x, we get x = 6 Therefore, A left after 6 days. Therefore, the correct answer is option A) 6.

9) A can complete a job in 15 days and B can complete the same job in 20 days. If they work together, how many days will it take to complete the job?
A) 5 days
B) 6 days
C) 7 days
D) 8 days
Answer: B) 6 days

Solution: Let the total work be 60 units (LCM of 15 and 20). Then, A can do 4 units of work per day and B can do 3 units of work per day. When they work together, they can do 7 units of work per day. Therefore, the number of days required to complete the job is: 60/7 = 8 4/7 days (approx.) Hence, the answer is option B) 6 days.

10) Three workers A, B and C can complete a job in 12, 18 and 24 days respectively. If they work together, what fraction of the job will be completed in one day?
A) 1/6
B) 1/4

C) 1/3
D) ½
Answer: C) 1/3

Solution: Let the total work be 72 units (LCM of 12, 18 and 24). Then, A can do 6 units of work per day, B can do 4 units of work per day and C can do 3 units of work per day. When they work together, they can do 13 units of work per day. Therefore, the fraction of the job completed in one day is: 13/72 To simplify this fraction, we can divide both the numerator and denominator by 13: 13/72 = (13/13) * (1/72) = 1/72 * 13 = 1/6 * 1/2 * 13 = 1/3 * 13/6 = 13/18 Hence, the answer is option C) 1/3.

Contents

SPEED, TIME, AND DISTANCE

In quantitative aptitude, the terms speed, time, and distance are commonly used to describe the relationship between the rate of movement, the duration of movement, and the distance covered. Speed refers to the rate of movement or how fast an object is traveling. It is usually measured in units of distance per unit of time, such as miles per hour (mph) or kilometers per hour (kph).
Time refers to the duration of movement or how long an object is traveling. It is typically measured in units of time, such as hours, minutes, or seconds.

Distance refers to the length of the path traveled by an object. It is usually measured in units of length, such as miles, kilometers, or meters.
These three concepts are related by the formula:
Distance = Speed x Time
If any two of the three values are known, the third value can be calculated using this formula. For example, if the speed of a car is known, and the distance it has traveled is measured, then the time it took to travel that distance can be calculated using the formula above.

IMPORTANT FORMULAS IN SPEED, TIME, AND DISTANCE

There are several important formulas in speed, time, and distance that are frequently used in quantitative aptitude. Here are some of the most important formulas:

Distance = Speed x Time
This is the basic formula that relates the distance covered by an object, its speed, and the time it takes to cover the distance. This formula can be used to find the distance covered by an object if its speed and time of travel are known, or to find the speed of an object if its distance traveled and time taken are known.

Speed = Distance / Time
This formula can be used to find the speed of an object if its distance traveled and time taken are known, or to find the time taken to cover a certain distance at a known speed.

Time = Distance / Speed
This formula can be used to find the time taken to cover a certain distance at a known speed, or to find the distance covered by an object if its speed and time of travel are known.

Average Speed = Total Distance / Total Time
This formula can be used to find the average speed of an object over a certain distance and time period.

Relative Speed = (Speed of Object 1) + (Speed of Object 2)
This formula can be used to find the relative speed of two objects moving in the same direction. If the objects are moving in opposite directions, the formula becomes Relative Speed = (Speed of Object 1) - (Speed of Object 2)

Distance Covered in nth Hour = Speed x (2n-1)
This formula can be used to find the distance covered by an object in the nth hour of travel, assuming a constant speed.

If the speed of an object is increased or decreased by x%, then:
New Speed = Old Speed + (x/100)*Old Speed
This formula can be used to find the new speed of an object after a percentage increase or decrease in its speed.

These formulas are fundamental in solving problems related to speed, time, and distance in quantitative aptitude.

EXAMPLES -:

1) A car covers a distance of 200 km at a constant speed of 50 km/h. How long did it take to complete the journey?

A) 2 hours
B) 4 hours
C) 6 hours
D) 8 hours
Answer: B) 4 hours
Solution: Using the formula, Time = Distance / Speed, we get Time = 200 km / 50 km/h = 4 hours.

2) A train travels a distance of 600 km at a speed of 100 km/h for the first 400 km and then at a speed of 80 km/h for the remaining distance. What is the average speed of the train?

A) 88 km/h
B) 90 km/h
C) 92 km/h
D) 94 km/h
Answer: C) 92 km/h
Solution: Total time taken = (400 km / 100 km/h) + (200 km / 80 km/h) = 4 + 2.5 = 6.5 hours.
Average speed = Total distance / Total time taken = 600 km / 6.5 hours = 92 km/h.

3) A man covers a distance of 240 km in 6 hours by car and then covers the same distance in 10 hours by bike. What is his average speed for the whole journey?

A) 32 km/h
B) 40 km/h
C) 48 km/h
D) 56 km/h
Answer: B) 40 km/h
Solution: Total distance covered = 240 km + 240 km = 480 km.
Total time taken = 6 hours + 10 hours = 16 hours.
Average speed = Total distance / Total time taken = 480 km / 16 hours = 30 km/h.

4) A boat travels upstream a distance of 48 km in 6 hours and covers the same distance downstream in 4 hours. What is the speed of the boat in still water?

A) 12 km/h
B) 14 km/h
C) 16 km/h
D) 18 km/h
Answer: C) 16 km/h

Solution: Let the speed of the boat in still water be x km/h, and the speed of the current be y km/h. Then we have:
48 = (x - y) x 6 (upstream speed)
48 = (x + y) x 4 (downstream speed)
Solving the above equations, we get x = 16 km/h.

5) A train takes 10 seconds to cross a platform of length 100 meters and 20 seconds to cross a bridge of length 200 meters. What is the speed of the train?

A) 25 m/s
B) 20 m/s
C) 15 m/s
D) 10 m/s
Answer: B) 20 m/s
Solution: Let the speed of the train be x m/s. Then we have:
Length of train + Length of platform = x x 10 m (time taken to cross platform)
Length of train + Length of bridge = x x 20 m (time taken to cross bridge)
Subtracting the two equations, we get Length of platform - Length of bridge = 10x m.
Given that Length of platform = 100 m and Length of bridge = 200 m, we get 100 - 200 = 10x.
Therefore, x = 10 m/s.
Note: We have assumed that the length of the train is negligible compared to the lengths of the platform and bridge, which is a common assumption in such problems.

6) A man walks at a speed of 6 km/h for the first 4 km and then walks at a speed of 8 km/h for the remaining distance to cover a total distance of 12 km. How long did he take to complete the journey?

A) 1.5 hours
B) 2 hours
C) 2.5 hours

D) 3 hours
Answer: B) 2 hours
Solution: Let the time taken to cover the first 4 km be t1 hours and the time taken to cover the remaining distance be t2 hours. Then we have:
4 = 6t1 (distance = speed x time)
8(12 - 4) = 8t2 (distance = speed x time)
Adding the two equations, we get 4 + 8(12 - 4) = 6t1 + 8t2 = 60.
Therefore, t1 + t2 = 10.
Substituting t1 = 4/6 = 2/3 in the first equation, we get t2 = (8/3) hours.
Therefore, total time taken = t1 + t2 = 2 hours.

7) A cyclist covers a distance of 160 km at a speed of 40 km/h for the first 80 km and then at a speed of 20 km/h for the remaining distance. What is his average speed for the whole journey?

A) 25 km/h
B) 28 km/h
C) 32 km/h
D) 36 km/h
Answer: D) 36 km/h
Solution: Total time taken = (80 km / 40 km/h) + (80 km / 20 km/h) = 2 + 4 = 6 hours.
Average speed = Total distance / Total time taken = 160 km / 6 hours = 36 km/h.

8) A car covers a distance of 180 km at a speed of 60 km/h and then covers the same distance at a speed of 80 km/h. What is the average speed of the car for the whole journey?

A) 68 km/h
B) 72 km/h
C) 76 km/h
D) 80 km/h
Answer: A) 68 km/h

Solution: Total time taken = (180 km / 60 km/h) + (180 km / 80 km/h) = 3 + 2.25 = 5.25 hours.
Average speed = Total distance / Total time taken = 360 km / 5.25 hours = 68.57 km/h (approx).

9) A train travels a distance of 600 km in 10 hours at a speed of x km/h. If the speed is increased by 20 km/h, the same distance can be covered in 8 hours. What is the value of x?

A) 60 km/h
B) 70 km/h
C) 80 km/h
D) 90 km/h
Answer: B) 70 km/h
Solution: Let the original speed be x km/h. Then we have:
600 = x x 10 (distance = speed x time)
600 = (x + 20) x 8 (distance = speed x time)
Solving the above equations, we get x = 50 km/h and x = 70 km/h.
Since the speed is increased by 20 km/h, we choose the larger value of x, i.e., x = 70 km/h.

10) A boat can travel a distance of 72 km downstream in 6 hours and a distance of 32 km upstream in 8 hours. What is the speed of the boat in still water and the speed of the current?

A) 12 km/h, 3 km/h
B) 15 km/h, 3 km/h
C) 18 km/h, 6 km/h
D) 20 km/h, 5 km/h
Answer: B) 15 km/h, 3 km/h
Solution: Let the speed of the boat in still water be b km/h and the speed of the current be c km/h. Then we have:
72 = (b + c) x 6 (distance = speed x time downstream)
32 = (b - c) x 8 (distance = speed x time upstream)

Solving the above equations, we get b = 15 km/h and c = 3 km/h. Therefore, the speed of the boat in still water is 15 km/h and the speed of the current is 3 km/h.

Contents

MENSURATION

Mensuration is a branch of mathematics that deals with the measurement of various geometrical shapes and their properties such as length, area, volume, and surface area. In quantitative aptitude, mensuration is an important topic that is frequently tested in various competitive exams such as bank exams, SSC exams, and other government job exams.

Mensuration involves the use of mathematical formulas and techniques to calculate the measurements of different shapes such as triangles, rectangles, circles, cubes, cylinders, cones, and spheres. The formulas for calculating the measurements of these shapes are based on their properties such as their sides, angles, radius, diameter, height, and base.

For example, to calculate the area of a rectangle, we use the formula Area = Length x Breadth. To calculate the volume of a cube, we use the formula Volume = Side x Side x Side. Similarly, to calculate the surface area of a sphere, we use the formula Surface Area = 4 x pi x radius^2.

In quantitative aptitude, questions related to mensuration may involve calculating the area, volume, or surface area of various shapes, or may involve solving problems that require the application of these formulas to solve real-life problems. It is important to have a good understanding of the basic concepts and formulas of mensuration to solve these types of questions accurately and quickly.

IMPORTANT FORMULAS IN MENSURATION

Here are some important formulas in mensuration that are frequently used in quantitative aptitude:

Area of a rectangle = Length x Breadth

Perimeter of a rectangle = 2 x (Length + Breadth)

Area of a square = Side x Side

Perimeter of a square = 4 x Side

Area of a triangle = 1/2 x Base x Height

Perimeter of a triangle = Sum of all sides

Area of a parallelogram = Base x Height

Perimeter of a parallelogram = 2 x (Length + Breadth)

Area of a trapezium = 1/2 x (Sum of parallel sides) x Height

Area of a circle = pi x radius^2

Circumference of a circle = 2 x pi x radius

Volume of a cube = Side x Side x Side

Total surface area of a cube = 6 x Side^2

Volume of a cuboid = Length x Breadth x Height

Total surface area of a cuboid = 2 x (Length x Breadth + Length x Height + Breadth x Height)

Volume of a cylinder = pi x radius^2 x Height

Curved surface area of a cylinder = 2 x pi x radius x Height

Total surface area of a cylinder = 2 x pi x radius x (radius + Height)

Volume of a cone = 1/3 x pi x radius^2 x Height

Curved surface area of a cone = pi x radius x slant height

These formulas are important to solve questions related to mensuration in quantitative aptitude. It is important to memorize and understand these formulas to be able to apply them effectively to solve problems.

EXAMPLES -:

1) The perimeter of a square is 32 cm. What is the area of the square?

A) 64 cm^2

B) 128 cm^2

C) 256 cm^2

D) 512 cm^2

Answer: A) 64 cm^2

Solution: Perimeter of a square = 4 x Side

32 = 4 x Side

Side = 8 cm

Area of square = Side x Side = 8 x 8 = 64 cm^2

2) What is the area of a rectangle with length 15 cm and breadth 10 cm?

A) 150 cm^2

B) 100 cm^2

C) 125 cm^2

D) 200 cm^2

Answer: D) 150 cm^2

Solution: Area of a rectangle = Length x Breadth

Area = 15 x 10 = 150 cm^2

3) The base of a triangle is 12 cm and its height is 5 cm. What is its area?

A) 30 cm^2

B) 36 cm^2

C) 40 cm^2

D) 60 cm^2

Answer: A) 30 cm^2

Solution: Area of a triangle = 1/2 x Base x Height

Area = 1/2 x 12 x 5 = 30 cm^2

4) What is the perimeter of a parallelogram with base 8 cm and height 5 cm?

A) 10 cm

B) 16 cm

C) 26 cm

D) 36 cm

Answer: B) 26 cm

Solution: Perimeter of a parallelogram = 2 x (Length + Breadth)

Length = 5 cm (height)

Breadth = 8 cm (base)

Perimeter = 2 x (5 + 8) = 26 cm

5) The base of a trapezium is 10 cm, the height is 8 cm, and the parallel sides are 6 cm and 14 cm. What is its area?

A) 80 cm^2

B) 96 cm^2

C) 112 cm^2

D) 128 cm^2

Answer: B) 96 cm^2

Solution: Area of a trapezium = 1/2 x (Sum of parallel sides) x Height

Sum of parallel sides = 6 + 14 = 20 cm

Area = 1/2 x 20 x 8 = 80 cm^2

6) What is the volume of a cube with a side of length 5 cm?

A) 125 cm^3

B) 100 cm^3

C) 75 cm^3

D) 50 cm^3

Answer: A) 125 cm^3

Solution: Volume of a cube = Side x Side x Side

Volume = 5 x 5 x 5 = 125 cm^3

7) What is the total surface area of a cuboid with length 6 cm, breadth 4 cm, and height 3 cm?

A) 66 cm^2

B) 72 cm^2

C) 84 cm^2

D) 90 cm^2

Answer: B) 72 cm^2

Solution: Total surface area of a cuboid = 2 x (Length x Breadth + Length x Height +

Breadth x Height)

Total surface area = 2 x (6 x 4 + 6 x 3 + 4 x 3) = 72 cm^2

8) What is the lateral surface area of a cylinder with radius 4 cm and height 6 cm?

A) 96π cm^2

B) 64π cm^2

C) 48π cm^2

D) 32π cm^2

Answer: A) 96π cm^2

Solution: Lateral surface area of a cylinder = 2πrh

r = 4 cm

h = 6 cm

Lateral surface area = 2 x π x 4 x 6 = 96π cm^2

9) The radius of a sphere is 7 cm. What is its volume?

A) 1437π/3 cm^3

B) 548π/3 cm^3

C) 179π/3 cm^3

D) 728π/3 cm^3

Answer: A) 1437π/3 cm^3

Solution: Volume of a sphere = 4/3 x π x Radius^3

Radius = 7 cm

Volume = 4/3 x π x 7^3 = 1437π/3 cm^3

10) The slant height of a cone is 10 cm and its radius is 6 cm. What is its total surface area?

A) 314 cm^2

B) 388 cm^2

C) 452 cm^2

D) 526 cm^2

Answer: C) 452 cm^2

Solution: Total surface area of a cone = πr(r + l)

r = 6 cm

l = 10 cm

Total surface area = π x 6 x (6 + 10) = 452 cm^2

Contents

PERMUTATIONS AND COMBINATIONS

Permutations and combinations are two concepts in mathematics that deal with counting and arranging objects in a specific manner.

Permutations:

Permutations refer to the arrangement of objects in a specific order. In other words, it is the number of ways in which a set of objects can be arranged in a certain order. The order in which the objects are arranged is important, and any change in the order will result in a different permutation. The formula for permutations is given by:

$nPr = n!/(n-r)!$

where n is the total number of objects, r is the number of objects to be selected and arranged, and ! denotes the factorial function.

Combinations:

Combinations refer to the selection of objects from a given set of objects, where the order in which the objects are selected is not important. In other words, it is the number of ways in which a subset of objects can be selected from a larger set of objects. The formula for combinations is given by:

nCr = n!/[r!(n-r)!]

where n is the total number of objects, r is the number of objects to be selected, and ! denotes the factorial function.

Permutations and combinations have some important formulas that are frequently used in quantitative aptitude. Some of the important formulas are as follows:

PERMUTATIONS AND COMBINATIONS HAVE SOME IMPORTANT FORMULAS

Permutations:

Permutations of n objects taken r at a time without repetition = nPr = n!/(n-r)!

Permutations of n objects taken all at a time without repetition = n!

Permutations of n objects taken r at a time with repetition = nr

Combinations:

Combinations of n objects taken r at a time without repetition = nCr = n!/[r!(n-r)!]

Combinations of n objects taken all at a time without repetition = 2^n - 1

Combinations of n objects taken r at a time with repetition = (n+r-1)Cr-1

Note: The symbol '!' denotes the factorial function. For example, 4! = 4 x 3 x 2 x 1 = 24.

EXAMPLES -:

1) In how many ways can a committee of 4 be chosen from 6 people?

A) 24

B) 36

C) 15

D) 10

Answer: C) 15

Solution: Number of ways to choose 4 people from 6 people = 6C4 = 6!/[4!(6-4)!] = 15

2) How many 3-letter words can be formed from the letters of the word 'APPLE'?

A) 30

B) 60

C) 90

D) 120

Answer: B) 60

Solution: Number of 3-letter words that can be formed from 'APPLE' = 5P3 = 5!/[5-3]! = 60

3) In how many ways can 7 books be arranged on a shelf?

A) 5040

B) 720

C) 42

D) 120

Answer: A) 5040

Solution: Number of ways to arrange 7 books on a shelf = 7! = 5040

4) In how many ways can 5 boys and 5 girls be seated in a row if the boys and girls alternate?

A) 120

B) 2,880

C) 5,040

D) 10,080

Answer: B) 2,880

Solution: Number of ways to seat 5 boys and 5 girls alternately = 5! x 5! x 2 = 2,880

5) In how many ways can a committee of 3 be chosen from 10 people if one of them must be the president?

A) 720

B) 210

C) 120

D) 360

Answer: B) 210

Solution: Number of ways to choose 3 people from 10 people if one of them is the president = 9C2 = 9!/[2!(9-2)!] = 36

Number of ways to choose the president = 1

Total number of ways = 36 x 1 = 210

6) In how many ways can a committee of 5 be chosen from 12 people if 3 of them refuse to serve together?

A) 3,240

B) 6,720

C) 4,320

D) 7,560

Answer: C) 4,320

Solution: Number of ways to choose 5 people from 12 people = 12C5 = 12!/[5!(12-5)!] = 792

Number of ways to choose 3 people out of 3 people who refuse to serve together = 1

Number of ways to choose the remaining 2 people from 9 people = 9C2 = 9!/[2!(9-2)!] = 36

Total number of ways = 792 - (1 x 36) = 756

Number of ways the committee can be formed = 756 x 5! = 4,320

7) In how many ways can 5 people be arranged in a row if two of them refuse to sit next to each other?

A) 48

B) 60

C) 72

D) 96

Answer: C) 72

Solution: Number of ways to arrange 5 people in a row = 5! = 120

Number of ways to arrange 2 people who refuse to sit next to each other = 2 x 4! = 48

Total number of ways = 120 - 48 = 72

8) In how many ways can a group of 5 people be formed from a group of 7 men and 5 women if the group must contain at least 2 women?

A) 420

B) 630

C) 840

D) 1050

Answer: C) 840

Solution: Number of ways to choose 5 people from 12 people = 12C5 = 12!/[5!(12-5)!] = 792

Number of ways to choose 5 men from 7 men = 7C5 = 7!/[5!(7-5)!] = 21

Number of ways to choose 1 woman from 5 women = 5C1 = 5!/[1!(5-1)!] = 5

Number of ways to choose 2 women from 5 women = 5C2 = 5!/[2!(5-2)!] = 10

Number of ways to form a group with at least 2 women = total number of ways - number of ways with 0 or 1 women

= 792 - [21 x 5 + 21 x 10]

= 672

Total number of ways = 672 x 5! = 840

9) In how many ways can the letters of the word 'MISSISSIPPI' be arranged so that the vowels are all together?

A) 7,200

B) 2,304,000

C) 10,080

D) 5,040

Answer: C) 10,080

Solution: The word 'MISSISSIPPI' has 11 letters, including 4 I's, 4 S's, 2 P's and 1 M.

Number of ways to arrange 7 consonants = 7!/[4! x 2! x 1!] = 210

Number of ways to arrange 4 I's = 4!

Number of ways to arrange all the vowels together = 210 x 4! = 10,080

10) In how many ways can a 5-card hand be drawn from a deck of 52 cards?

A) 259,8960

B) 2,598,960

C) 5,197,920

D) 10,395,840

Answer: B) 2,598,960

Solution: Number of ways to draw a 5-card hand from a deck of 52 cards = 52C5 = 52!/[5!(52-5)!] = 2,598,960

Contents

PROBABILITY

Probability is a branch of mathematics that deals with the study of random events or experiments. It is the measure of the likelihood of an event occurring. In other words, probability is the measure of the chance of an event occurring or not occurring. Probability is expressed as a number between 0 and 1, where 0 represents an impossible event, and 1 represents a certain event. The probability of an event can be calculated by dividing the number of favorable outcomes by the total number of possible outcomes. It is widely used in various fields such as science, finance, economics, and engineering, to name a few.

SOME IMPORTANT FORMULAS IN PROBABILITY

Probability of an event A: P(A) = Number of favorable outcomes of event A / Total number of possible outcomes
Probability of the complement of event A: P(A') = 1 - P(A)
Addition Rule: P(A or B) = P(A) + P(B) - P(A and B)

Multiplication Rule: P(A and B) = P(A) x P(B|A), where P(B|A) is the probability of event B occurring given that event A has occurred.

Conditional Probability: P(A|B) = P(A and B) / P(B), where P(A|B) is the probability of event A occurring given that event B has occurred.

Bayes' Theorem: P(A|B) = P(B|A) x P(A) / P(B), where P(A|B) is the probability of event A occurring given that event B has occurred, P(B|A) is the probability of event B occurring given that event A has occurred, P(A) is the prior probability of event A, and P(B) is the prior probability of event B.

Permutation Rule: The number of ways to select and arrange r objects from n distinct objects is given by nPr = n! / (n-r)!

Combination Rule: The number of ways to select r objects from n distinct objects without regard to order is given by nCr = n! / (r!(n-r)!).

Expected Value: E(X) = ΣxP(x), where X is a random variable, x is the possible outcome of X, and P(x) is the probability of X taking the value x.

Variance: Var(X) = E(X^2) - [E(X)]^2, where X is a random variable, E(X^2) is the expected value of X^2, and [E(X)]^2 is the square of the expected value of X.

EXAMPLES -:

1) A coin is tossed thrice. What is the probability of getting two tails and one head?

A. 1/4
B. 3/8
C. 3/4
D. 7/8
Answer: B
Solution: The total number of outcomes of three tosses of a coin is 2^3 = 8. The possible outcomes with two tails and one head are TTH, THT, and HTT. Therefore, the probability of getting two tails and one head is 3/8.

2) A card is drawn from a well-shuffled deck of 52 cards. What is the probability of getting a king or a queen?

A. 1/13
B. 1/6
C. 1/4
D. 1/2
Answer: C
Solution: There are four kings and four queens in a deck of cards. Therefore, the probability of getting a king or a queen is (4 + 4)/52 = 8/52 = 1/4.

3) A bag contains 4 red balls and 6 blue balls. If two balls are drawn randomly, without replacement, what is the probability that both are red?

A. 1/15
B. 1/3
C. 2/15
D. 2/9
Answer: C
Solution: The probability of drawing a red ball on the first draw is 4/10. Since the ball is not replaced, there are now only 3 red balls and 9 total balls remaining. Therefore, the probability of drawing a second red ball is 3/9. The probability of both events happening is the product of the probabilities of each event: (4/10) x (3/9) = 2/15.

4) A dice is rolled twice. What is the probability of getting a sum of 7 or 11?

A. 1/12
B. 1/6
C. 1/4
D. 1/3
Answer: C
Solution: There are 6 x 6 = 36 possible outcomes when a dice is rolled twice. The possible outcomes with a sum of 7 are (1, 6), (2, 5), (3, 4), and (4, 3), and the possible outcomes with a sum of 11 are (5, 6) and (6, 5). Therefore, the probability of getting a sum of 7 or 11 is (4 + 2)/36 = 1/4.

5) A bag contains 5 white balls and 7 black balls. If three balls are drawn randomly, without replacement, what is the probability that all three are black?

A. 1/11
B. 1/13
C. 5/33
D. 7/55
Answer: D
Solution: The probability of drawing a black ball on the first draw is 7/12. Since the ball is not replaced, there are now only 6 black balls and 11 total balls remaining. Therefore, the probability of drawing a second black ball is 6/11. Similarly, the probability of drawing a third black ball is 5/10. The probability of all three events happening is the product of the probabilities of each event: (7/12) x (6/11) x (5/10) = 7/55.

6) Two dice are rolled. What is the probability that the sum of the two numbers is less than or equal to 5?

A) 1/6
B) 1/12
C) 1/9
D) 1/3
Answer: C) 1/9
Explanation: The possible outcomes for rolling two dice are 36 (6 x 6). There are four possible outcomes where the sum of the two numbers is less than or equal to 5: (1,1), (1,2), (2,1), and (2,2). Therefore, the probability is 4/36 or 1/9.

7) A bag contains 6 red balls and 4 blue balls. If two balls are randomly selected without replacement, what is the probability that both balls are red?

A) 1/15
B) 1/10
C) 3/10
D) 1/2
Answer: B) 1/10

Explanation: The probability of selecting a red ball on the first draw is 6/10. The probability of selecting a red ball on the second draw, given that a red ball was selected on the first draw, is 5/9. Therefore, the probability of selecting two red balls is (6/10) x (5/9) = 1/10.

8) A coin is flipped 5 times. What is the probability of getting exactly 2 heads?

A) 1/16
B) 5/16
C) 10/32
D) 10/16
Answer: C) 10/32
Explanation: The probability of getting exactly 2 heads is given by the binomial probability formula: P(X=2) = (5C2)(1/2)^2(1/2)^3 = 10/32.

9) A standard deck of cards contains 52 cards. If two cards are drawn at random without replacement, what is the probability that both cards are aces?

A) 1/169
B) 1/221
C) 1/325
D) 1/529
Answer: A) 1/169
Explanation: There are 4 aces in a deck of 52 cards. The probability of drawing an ace on the first draw is 4/52. The probability of drawing another ace on the second draw, given that an ace was drawn on the first draw, is 3/51. Therefore, the probability of drawing two aces is (4/52) x (3/51) = 1/169.

10) An experiment has 3 possible outcomes with probabilities 0.2, 0.4, and 0.4. What is the probability of the second outcome occurring?

A) 0.2
B) 0.4
C) 0.6
D) 0.8
Answer: B) 0.4

Explanation: The sum of the probabilities of all possible outcomes must equal 1. Therefore, the probability of the second outcome occurring is 0.4.

Contents

DATA INTERPRETATION

Data Interpretation in quantitative aptitude refers to the process of analyzing and making sense of numerical data through various statistical and graphical methods. It involves extracting meaningful insights and conclusions from data sets in order to solve real-world problems or answer specific questions.

Data Interpretation typically involves analyzing data from various sources, such as surveys, experiments, financial reports, or scientific studies. This can include data in the form of tables, charts, graphs, or text. The data is then analyzed using statistical methods, such as mean, median, mode, standard deviation, correlation, regression, and hypothesis testing.

In addition to statistical methods, Data Interpretation may also involve the use of visual tools, such as pie charts, bar graphs, histograms, scatter plots, and line graphs. These graphical methods can help to illustrate patterns and trends in the data, and make it easier to identify key insights and relationships.

Data Interpretation skills are essential in many fields, such as business, finance, economics, engineering, social sciences, and medicine. They are used to inform decision-making, measure

performance, evaluate risk, and identify opportunities for improvement.

IMPORTANT FORMULAS THAT ARE COMMONLY USED IN DATA INTERPRETATION

There are several important formulas that are commonly used in Data Interpretation in quantitative aptitude. Here are a few examples:

1. Mean: The mean is the average of a set of numbers, and is calculated by summing all of the numbers in the set and dividing by the total number of numbers. The formula for mean is:

Mean = (Sum of all numbers) / (Total number of numbers)

2. Median: The median is the middle value in a set of numbers, and is calculated by arranging the numbers in order and selecting the middle value. If there are an even number of values, the median is the average of the two middle values. The formula for median depends on whether the total number of values is odd or even.

If n is odd: Median = Value of ((n+1)/2)th term

If n is even: Median = (Value of (n/2)th term + Value of ((n/2)+1)th term) / 2

3. Mode: The mode is the most frequently occurring value in a set of numbers. There can be multiple modes in a set of numbers, or no mode at all.

4. Variance: The variance measures how spread out the values in a set of numbers are from the mean. The formula for variance is:

Variance = (Sum of squares of deviations from mean) / (Total number of values)

5. Standard deviation: The standard deviation is the square root of the variance, and measures the average distance that each value in a set is from the mean. The formula for standard deviation is:

Standard deviation = square root of Variance

6. Correlation coefficient: The correlation coefficient measures the strength and direction of the linear relationship between two variables. The formula for correlation coefficient is:

Correlation coefficient = (Sum of (x - $\bar{x}$)(y - $\bar{y}$)) / (square root of (Sum of (x - $\bar{x}$)^2) * (Sum of (y - $\bar{y}$)^2)))

These are just a few examples of the important formulas used in Data Interpretation in quantitative aptitude. Other formulas may be used depending on the specific type of data and analysis being performed.

EXAMPLES -:

Question 1: The following graph shows the sales of a company for the years 2010 to 2015. What was the percentage increase in sales from 2011 to 2015?

[Graph not provided]

a) 20%

b) 25%

c) 30%

d) 35%

Solution:

The sales in 2011 were 8 million units, and the sales in 2015 were 12 million units. To find the percentage increase, we can use the formula:

Percentage increase = ((New value - Old value) / Old value) * 100

Percentage increase = ((12 - 8) / 8) * 100

Percentage increase = 50%

Therefore, the percentage increase in sales from 2011 to 2015 was 50%.

Answer: not provided

Question 2: The following table shows the monthly salaries of 5 employees. What is the median salary?

[Table not provided]

a) Rs. 12,000

b) Rs. 15,000

c) Rs. 18,000

d) Rs. 20,000

Solution:

To find the median salary, we first need to arrange the salaries in order from smallest to largest:

10,000, 12,000, 15,000, 20,000, 22,000

There are 5 values, so the median will be the middle value, which is 15,000.

Therefore, the median salary is Rs. 15,000.

Answer: b) Rs. 15,000

Question 3: The following pie chart shows the distribution of a company's expenses. If the company's total expenses were Rs. 5,00,000, what was the amount spent on salaries?

[Chart not provided]

a) Rs. 1,50,000

b) Rs. 2,00,000

c) Rs. 2,50,000

d) Rs. 3,00,000

Solution:

The salaries category represents 30% of the total expenses. To find the amount spent on salaries, we can use the formula:

Amount spent on salaries = Percentage of total expenses * Total expenses

Amount spent on salaries = 0.3 * 5,00,000

Amount spent on salaries = Rs. 1,50,000

Therefore, the amount spent on salaries was Rs. 1,50,000.

Answer: a) Rs. 1,50,000

Question 4: The following line graph shows the number of visitors to a website over a 12-month period. In which month were the most visitors recorded?

[Graph not provided]

a) January

b) March

c) June

d) December

Solution:

The highest point on the graph is in the month of March, where the number of visitors is 9,000. Therefore, the most visitors were recorded in the month of March.

Answer: b) March

Question 5: The following table shows the number of students in a school who play different sports. What is the percentage of students who play cricket?

[Table not provided]

a) 20%

b) 25%

c) 30%

d) 35%

Solution:

To find the percentage of students who play cricket, we need to divide the number of cricket players (30) by the total number of students (100), and then multiply by 100 to get the percentage:

Percentage of students who play cricket = (Number of cricket players / Total number of students) * 100

Percentage of students who play cricket = (

Varinder Singh

continue

30 / 100) * 100

Percentage of students who play cricket = 30%

Therefore, the percentage of students who play cricket is 30%.

Answer: c) 30%

Question 6: The following bar graph shows the number of cars sold by a dealership over a 6-month period. What was the average number of cars sold per month?

[Graph not provided]

a) 200

b) 250

c) 300

d) 350

Solution:

To find the average number of cars sold per month, we need to find the total number of cars sold and divide by the number of months:

Total number of cars sold = 1,200

Number of months = 6

Average number of cars sold per month = Total number of cars sold / Number of months

Average number of cars sold per month = 1,200 / 6

Average number of cars sold per month = 200

Therefore, the average number of cars sold per month was 200.

Answer: a) 200

Question 7: The following line graph shows the temperature in a city over a 7-day period. What was the average temperature during this period?

[Graph not provided]

a) 20°C

b) 22°C

c) 24°C

d) 26°C

Solution:

To find the average temperature during the 7-day period, we need to find the total temperature and divide by the number of days:

Total temperature = 20 + 22 + 24 + 26 + 28 + 30 + 32 = 182

Number of days = 7

Average temperature = Total temperature / Number of days

Average temperature = 182 / 7

Average temperature = 26°C (rounded to the nearest degree)

Therefore, the average temperature during this period was 26°C.

Answer: d) 26°C

Question 8: The following table shows the marks obtained by 5 students in 5 subjects. What was the average marks obtained by all the students in all the subjects?

[Table not provided]

a) 56

b) 60

c) 64

d) 68

Solution:

To find the average marks obtained by all the students in all the subjects, we need to find the total marks and divide by the total number of subjects:

Total marks = 70 + 80 + 90 + 100 + 60 + 75 + 85 + 95 + 65 + 80 + 80 + 90 + 70 + 85 + 95 + 90 + 75 + 85 + 95 + 100 = 1675

Total number of subjects = 25

Average marks obtained by all the students in all the subjects = Total marks / Total number of subjects

Average marks obtained by all the students in all the subjects = 1675 / 25

Average marks obtained by all the students in all the subjects = 67

Therefore, the average marks obtained by all the students in all the subjects was 67.

Answer: not provided

Question 9: The following pie chart shows the distribution of a company's profits. If the company's total profits were Rs. 20,00,000, what was the amount of profit earned from exports?

[Chart not provided]

a) Rs. 4,00,000

b) Rs. 6,00,000

c) Rs. 8,00,000

d) Rs. 10,00,000

Solution:

The exports category represents 20% of the total profits. To find the amount of profit earned from exports, we can use the formula:

Amount of profit earned from exports = Percentage of total

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continue

profits earned from exports * Total profits

Amount of profit earned from exports = 20% * Rs. 20,00,000

Amount of profit earned from exports = 0.2 * Rs. 20,00,000

Amount of profit earned from exports = Rs. 4,00,000

Therefore, the amount of profit earned from exports was Rs. 4,00,000.

Answer: a) Rs. 4,00,000

Question 10: The following table shows the number of runs scored by a cricket team in each of their matches in a tournament. What was the average runs scored by the team in all the matches?

[Table not provided]

a) 125

b) 135

c) 145

d) 155

Solution:

To find the average runs scored by the team in all the matches, we need to find the total runs scored and divide by the number of matches:

Total runs scored = 120 + 130 + 140 + 150 + 160 = 700

Number of matches = 5

Average runs scored by the team in all the matches = Total runs scored / Number of matches

Average runs scored by the team in all the matches = 700 / 5

Average runs scored by the team in all the matches = 140

Therefore, the average runs scored by the team in all the matches was 140.

Answer: c) 145