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1. Amina thinks of a number and subtracts 5/2 from it. She multiplies the result by 8. The result now obtained is 3 times the same number she thought of. What is the number?

Solution:

Let the number be x,

According to the question,

$(x – 5/2) \times 8 = 3x$

$\Rightarrow 8x – 40/2 = 3x$

$\Rightarrow 8x – 3x = 40/2$

$\Rightarrow 5x = 20$

$\Rightarrow x = 4$

Thus, the number is 4.

2. A positive number is 5 times another number. If 21 is added to both numbers, then one of the new numbers becomes twice the other new number. What are the numbers?

Solution:

Let one of the positive numbers be x, then the other number will be 5x. According to the question,

$5x + 21 = 2(x + 21)$

$\Rightarrow 5x + 21 = 2x + 42$

$\Rightarrow 5x – 2x = 42 – 21$

$\Rightarrow 3x = 21$

$\Rightarrow x = 7$

One number = x = 7

Other number = 5x = 5×7 = 35. The two numbers are 7 and 35.

3. Sum of the digits of a two-digit number is 9. When we interchange the digits, it is found that the resulting new number is greater than the original number by 27. What is the two-digit number?

Solution:

Let the digit at tens place be x, then the digit at ones place will be (9-x).

Original two-digit number = 10x + (9-x)

After interchanging the digits, the new number = 10(9-x) + x

According to the question,

10x + (9-x) + 27 = 10(9-x) + x

⇒ 10x + 9 – x + 27 = 90 – 10x + x

⇒ 9x + 36 = 90 – 9x

⇒ 9x + 9x = 90 – 36

⇒ 18x = 54

⇒ x = 3

Original number = 10x + (9-x) = (10×3) + (9-3) = 30 + 6 = 36

Thus, the number is 36.

4. One of the two digits of a two-digit number is three times the other digit. If you interchange the digits of this two-digit number and add the resulting number to the original number, you get 88. What is the original number?

Solution:

Let the digit at tens place be x, then the digit at ones place will be 3x.

Original two-digit number = 10x + 3x

After interchanging the digits, the new number = 30x + x

According to the question,

(30x + x) + (10x + 3x) = 88

⇒ 31x + 13x = 88

⇒ 44x = 88

⇒ x = 2

Original number = 10x + 3x = 13x = 13×2 = 26

5. Shobo's mother's present age is six times Shobo's present age. Shobo's age five years from now will be one-third of his mother's present age. What are their present ages?

Solution:

Let the present age of Shobo be x, then the age of her mother will be 6x.

Shobo's age after 5 years = x + 5

According to the question,

(x + 5) = (1/3) × 6x

⇒ x + 5 = 2x

⇒ 2x – x = 5

⇒ x = 5

Present age of Shobo = x = 5 years

The present age of Shobo's mother = 6x = 30 years.

6. There is a narrow rectangular plot reserved for a school in Mahuli village. The length and breadth of the plot are in the ratio 11:4. At the rate ₹100 per metre, it will cost the village panchayat ₹75000 to fence the plot. What are the dimensions of the plot?

Solution:

Let the length of the rectangular plot be 11x and the breadth be 4x.

Rate of fencing per metre = ₹100

Total cost of fencing = ₹75000

Perimeter of the plot = 2(l+b) = 2(11x + 4x) = 2×15x = 30x

Total amount of fencing = (30x × 100)

According to the question,

(30x × 100) = 75000

⇒ 3000x = 75000

⇒ x = 75000/3000

⇒ x = 25

Length of the plot = 11x = 11 × 25 = 275m

Breadth of the plot = 4 × 25 = 100m.

7. Hasan buys two kinds of cloth materials for school uniforms; shirt material that costs him ₹50 per metre and trouser material that costs him ₹90 per metre. For every 3 meters of the shirt material, he buys 2 metres of the trouser material. He sells the materials at 12% and 10% profit, respectively. His total sale is ₹36,600. How much trouser material did he buy?

Solution:

Let 2x m of trouser material and 3x m of shirt material be bought by him

Selling price of shirt material per meter = ₹ 50 + 50 ×(12/100) = ₹ 56

Selling price of trouser material per meter = ₹ 90 + 90 × (10/100) = ₹ 99

Total amount of sale = ₹36,600

According to the question,

(2x × 99) + (3x × 56) = 36600

⇒ 198x + 168x = 36600

⇒ 366x = 36600

⇒ x = 36600/366

⇒ x = 100

Total trouser material he bought = 2x = 2 × 100 = 200 m.

8. Half of a herd of deer is grazing in the field, and three-fourths of the remaining are playing nearby. The rest 9 are drinking water from the pond. Find the number of deer in the herd.

Solution:

Let the total number of deer be x.

Deer grazing in the field = x/2

Deer playing nearby = x/2 × ¾ = 3x/8

Deer drinking water = 9

According to the question,

x/2 + 3x/8 + 9 = x

(4x + 3x)/8 + 9 = x

⇒ 7x/8 + 9 = x

⇒ x – 7x/8 = 9

⇒ (8x – 7x)/8 = 9

⇒ x = 9 × 8

⇒ x = 72

9. A grandfather is ten times older than his granddaughter. He is also 54 years older than her. Find their present ages.

Solution:

Let the age of granddaughter be x and grandfather be 10x.

Also, he is 54 years older than her.

According to the question, 10x = x + 54

⇒ 10x – x = 54

⇒ 9x = 54

⇒ x = 6

Age of grandfather = 10x = 10×6 = 60 years.

Age of granddaughter = x = 6 years.

10. Aman's age is three times his son's age. Ten years ago, he was five times his son's age. Find their present ages.

Solution:

Let the age of Aman's son be x, then the age of Aman will be 3x.

According to the question,

5(x – 10) = 3x – 10

⇒ 5x – 50 = 3x – 10

⇒ 5x – 3x = -10 + 50

⇒ 2x = 40

⇒ x = 20

Aman's son age = x = 20 years

Aman age = 3x = 3×20 = 60 years