

TEXT BOOK EXERCISE 2.2

Q. 1. A number is such that it is as much greater than 84 as it is less than 108. Find it.

Solution. Let x be the number by which the required number is greater than 84. *and less than 108*

\therefore Required number = $84 + x$

According to the equation

$$84 + x = 108 - x$$

$$\Rightarrow x + x = 108 - 84$$

$$\Rightarrow 2x = 24$$

$$\Rightarrow x = \frac{24}{2} = 12$$

Thus, the required number = $84 + x$
 $= 84 + 12 = 96$ Ans.

Q. 2. Divide 34 into two parts in such a way

that $\left(\frac{4}{7}\right)^{\text{th}}$ of one part is equal to $\left(\frac{2}{5}\right)^{\text{th}}$ of the

other.

Solution. Let one part be x

Then, other part = $34 - x$

According to given condition

$\left(\frac{4}{7}\right)^{\text{th}}$ of one part = $\left(\frac{2}{5}\right)^{\text{th}}$ of the other part

$$\therefore \frac{4}{7} \times x = \frac{2}{5} \times (34 - x)$$

$$\Rightarrow 5 \times 4x = 2 \times 7 \times (34 - x)$$

$$\Rightarrow 20x = 476 - 14x$$

$$\Rightarrow 20x + 14x = 476$$

$$\Rightarrow 34x = 476$$

$$\Rightarrow x = \frac{476}{34} = 14$$

\therefore One part = $x = 14$

Other part = $34 - x = 34 - 14 = 20$ Ans.

Q. 3. Find a number such that when 5 is subtracted from 5 times the number, the result is 4 more than twice the number.

Solution. Let the required number be x .

According to the given condition

When 5 is subtracted from 5 times the number = 4 more than twice the number.

$$\therefore 5x - 5 = 2x + 4$$

$$\Rightarrow 5x - 2x = 4 + 5$$

$$\Rightarrow 3x = 9$$

$$\Rightarrow x = \frac{9}{3} = 3$$

Thus, the required number is 3 Ans.

Q. 4. The digits of a two digit number are differ by 3. If the digits are inter changed and the resulting number is added to the original number, we get 143. Find the original number.

Solution. We have given a two digit number which consists of ones place digit and tens place digit.

According to 1st condition, the digits of two digit number differ by 3.

Let ones digit be x , then tens digit be $x + 3$.

\therefore Original two digit number = $10 \times$ (tens digit) + (ones digit)

$$= 10 \times (x + 3) + x$$

$$= 10x + 30 + x = 11x + 30$$

With interchanging of digits, the resulting two digits number will be :

$$= 10x + (x + 3)$$

$$= 11x + 3$$

If we add these two, two digits numbers, their sum is

$$= (11x + 30) + (11x + 3)$$

$$= 11x + 11x + 30 + 3$$

$$= 22x + 33$$

It is given that the sum is 143.

Therefore, $22x + 33 = 143$

$$\Rightarrow 22x = 143 - 33$$

$$\Rightarrow 22x = 110$$

$$\Rightarrow x = \frac{110}{22}$$

$$\Rightarrow x = 5$$

The ones digit is 5

\therefore Original number = $11x + 30$

$$= 11 \times 5 + 30$$

$$= 55 + 30 = 85$$

Check : On interchange of digits the number

we get is 58.

The sum of 85 and 58 = $85 + 58 = 143$ as given.

Q. 5. Sum of 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. Find the two-digit number.

Solution. We have given a two digit number which consists of ones place digit and tens place digit.

The given condition : the sum of digits = 9

The sum of ones digit and tens digit = 9

Let ones digit be x and ten's digit be $9 - x$

\therefore Original number = $10 \times$ (tens digit) + (ones digit)

$$= 10 \times (9 - x) + x$$

$$= 90 - 10x + x$$

$$= 90 - 9x$$

When we interchange the digits the resulting new number

$$= 10 \times x + (9 - x) = 9x + 9$$

According to second condition

The resulting new number = Original number + 27

$$9x + 9 = (90 - 9x) + 27$$

$$\Rightarrow 9x + 9 = 90 - 9x + 27$$

$$\Rightarrow 9x + 9x = 90 + 27 - 9$$

$$\Rightarrow 18x = 108$$

$$\Rightarrow x = \frac{108}{18} = 6$$

\therefore Two digit number = $90 - 9x = 90 - 9 \times 6$

$$= 90 - 54 = 36 \text{ Ans.}$$

Q. 6. Preet is 6 years older than Abdul. Six years ago, Preet's age was four times Abdul's age. Find their present ages.

Solution. Let Abdul's present age = x years

Therefore Preet's present age = $(x + 6)$ years

Six years ago

Abdul's age = $(x - 6)$ years

Preet's age = $(x + 6 - 6)$ years

= x years

According to given condition

Six years ago, Preet's age was four times Abdul's age

$$\therefore x = 4 \times (x - 6)$$

$$\Rightarrow x = 4x - 24$$

$$\Rightarrow x - 4x = -24$$

$$\Rightarrow -3x = -24$$

$$\Rightarrow x = \frac{-24}{-3} = 8$$

Hence, Abdul's present age = x years

$$= 8 \text{ years}$$

Therefore preet's present age = $(x + 6)$ years

$$= (8 + 6) \text{ years}$$

$$= 14 \text{ years Ans.}$$

Q. 7. After 12 years, I shall be 3 times as old as was 4 years ago. Find my present age.

Solution. Let my present age = x years

After 12 years my age = $(x + 12)$ years

4 years ago my age = $(x - 4)$ years

According to given condition

After 12 years, I shall be 3 times as old as was 4 years ago.

$$\therefore (x + 12) = 3(x - 4)$$

$$\Rightarrow x + 12 = 3x - 12$$

$$\Rightarrow x - 3x = -12 - 12$$

$$\Rightarrow -2x = -24$$

$$\Rightarrow x = -\frac{24}{-2} = 12$$

Hence, my present age is 12 years Ans.

Q. 8. Jiya is twice as old as Kavya. If six years is subtracted from Kavya's age and four years added to Jiya's age, then Jiya will be four times Kavya's age. Find their present ages.

Solution. Let Kavya's present age = x years

\therefore Jiya's present age = $2x$ years

According to given condition if six years is subtracted from Kavya's age and four years is added to Jiya's age.

Then Jiya will be four times Kavya's age.

$$\therefore 2x + 4 = 4(x - 6)$$

$$\Rightarrow 2x + 4 = 4x - 24$$

$$\Rightarrow 2x - 4x = -24 - 4$$

$$\Rightarrow -2x = -28$$

$$\Rightarrow x = \frac{-28}{-2} = 14$$

Hence, Kavya's age = x years = 14 years

and Jiya's present age = $2x$ years

$$= 2 \times 14 \text{ years}$$

$$= 28 \text{ years. Ans.}$$