EXERCISE 22 (D)

Question 1.

A number increased by 17 becomes 54. Find the number.

Solution:

Let the required number = x

∴ According to the sum :

x+17 = 54

⇒ x = 54-17

⇒ x = 37

Required number = 37

Question 2.

A number decreased by 8 equals 26, find the number.

Solution:

Let required number = A

∴According to the sum :

x – 8 = 26

⇒A = 26 + 8

⇒A = 34

∴Required number = 34

Question 3.

One-fourth of a number added to two- seventh of it gives 135; find the number.

Solution:

Let required number = x

$\therefore$ According to the sum,

$$\frac{x}{4} + \frac{2}{7}x = 135$$

$$\Rightarrow \frac{7x+8x}{28} = 135 \qquad \text{(L.C.M. of 4, 7 = 28)}$$

$$\Rightarrow \frac{15x}{28} = 135 \Rightarrow x = \frac{135 \times 28}{15}$$

$$\Rightarrow x = 9 \times 28 = 252$$

$\therefore$ Required number = 252

Question 4.

Two-fifths of a number subtracted from three-fourths of it gives 56, find the number.

Solution:

Let the required number = x

According to the sum,

$$\frac{3}{4}x - \frac{2}{5}x = 56$$

$$\frac{15x-8x}{20} = 56 \Rightarrow \frac{7}{20}x = 56$$

$$\Rightarrow x = \frac{56 \times 20}{7} = 8 \times 20 = 160$$

$\therefore$ Required number = 160

Question 5.

A number is increased by 12 and the new number obtained is multiplied by 5. If the resulting number is 95, find the original number.

Solution:

Let the original number = x

According to the sum,

$(x + 12) \times 5 = 95$

$\Rightarrow 5x + 60 = 95 \Rightarrow 5x = 95 - 60$

$\Rightarrow 5x = 35 \Rightarrow x = \frac{35}{5} = 7$

$\therefore$ The original number = 7

Question 6.

A number is increased by 26 and the new number obtained is divided by 3. If the resulting number is 18; find the original number.

Solution:

Let the original number = x

According to the sum,

$(x + 26) \div 3 = 18$

$\Rightarrow \frac{x+26}{3} = 18 \Rightarrow x + 26 = 18 \times 3$

$\Rightarrow x + 26 = 54 \Rightarrow x = 54 - 26 = 28$

Question 7.

The age of a man is 27 years more than the age of his son. If the sum of their ages is 47 years, find the age of the son and his father.

Solution:

Let the age of son = x years

$\therefore$ Age of his father = $x + 27$

According to the sum :

$x + x + 27 = 47$

$\Rightarrow 2x + 27 = 47 \quad \Rightarrow 2x = 47 - 27 = 20$

$\Rightarrow x = \frac{20}{2} = 10$

$\therefore$ Age of son = 10 years

and age of his father = 10 + 27 = 37 years

Question 8.

The difference between the ages of Gopal and his father is 26 years. If the sum of their ages is 56 years, find the ages of Gopal and his father.

Solution:

Let age of Gopal = x years

$\therefore$ Age of his father = $(x + 26)$ years

According to the sum,

$x + x + 26 = 56$

$\Rightarrow 2x + 26 = 56 \quad \Rightarrow 2x = 56 - 26 = 30$

$\Rightarrow x = \frac{30}{2} = 15$

$\therefore$ Age of Gopal = 15 years

and age of his father = 15 + 26 = 41 years

Question 9.

When two consecutive natural numbers are added, the sum is 31; find the numbers.

Solution:

Let first natural number = x

Then second natural number = $x + 1$

According to the sum,

$x + x + 1 = 31$

$\Rightarrow 2x + 1 = 31 \Rightarrow 2x = 31 - 1 = 30$

$\Rightarrow x = \frac{30}{2} = 15$

$\therefore$ First natural number = 15

and second number = 15 + 1 = 16

Question 10.

When three consecutive natural numbers are added, the sum is 66, find the numbers.

Solution:

Let first natural number = x

Then second number = $x + 1$

and third number = $x + 2$

According to the sum,

$x + x + 1 + x + 2 = 66$

$\Rightarrow 3x + 3 = 66 \Rightarrow 3x = 66 - 3 = 63$

$\Rightarrow x = \frac{63}{3} = 21$

$\therefore$ First natural number = 21

Second number = 21 + 1 = 22

and third number = 22 + 1 = 23

Hence numbers are 21, 22, 23

Question 11.

A natural number decreased by 7 is 12. Find the number.

Solution:

Let the required number = x

Then $x - 7 = 12$

$\Rightarrow x - 7 + 7 = 12 + 7$

(Adding 7 to both sides)

$x = 19$

$\therefore$ Required number = 19

Question 12.

One fourth of a number added to one- sixth of itself is 15. Find the number.

Solution:

Let the required number = x

The $\frac{x}{4} + \frac{x}{6} = 15$

$= \frac{3x + 2x}{12} = 15$

$\Rightarrow \frac{5x}{12} = 15 \Rightarrow x = \frac{15 \times 12}{5}$

$\Rightarrow x = 36$

$\therefore$ Required number = 36

Question 13.

A whole number is increased by 7 and the new number so obtained is multiplied by 5; the result is 45. Find the number.

Solution:

Let the required whole number $= x$

Then $(x + 7) \times 5 = 45$

$$\Rightarrow \frac{(x+7)\times 5}{5} = \frac{45}{5} \qquad \text{(Dividing by 5)}$$

$$\Rightarrow x + 7 = 9$$

$$\Rightarrow x = 9 - 7$$

$$x = 2$$

$\therefore$ Required whole number $= 2$

Question 14.

The age of a man and the age of his daughter differ by 23 years and the sum of their ages is 41 years. Find the age of the man.

Solution:

Let age of daughter $= x$ years

Then age of man $= (x + 23)$

$\therefore\ x + (x + 23) = 41$

$x + x + 23 = 41 \Rightarrow 2x + 23 = 41$

$$\Rightarrow 2x = 41 - 23 = 18$$

$$\Rightarrow x = \frac{18}{2} = 9$$

$\therefore$ Age of man $= x + 23 = 9 + 23 = 32$ years

Question 15.

The difference between the ages of a woman and her son is 19 years and the sum of their ages is 37 years; find the age of the son.

Solution:

Let age of son = x years

The age of woman = $x + 19$

$\therefore\ x + x + 19 = 37$

$\Rightarrow\ 2x + 19 = 37$

$\Rightarrow\ 2x = 37 - 19 = 18$

$$\Rightarrow x = \frac{18}{2} = 9$$

$\therefore$ Age of son = 9 years

Question 16.

Two natrual numbers differ by 6 and sum of them is 36. Find the larger number.

Solution:

$\because$ Difference between two numbers = 6

and their sum = 36

Let first natural number = x

The second number = $x - 6$

$\therefore\ x + x - 6 = 36$

$\Rightarrow\ 2x = 36 + 6 = 42$

$$x = \frac{42}{2} = 21$$

$\therefore$ Larger number = 21

Question 17.

The difference between two numbers is 15. Taking the smaller number as x; find:
(i) the expression for larger number.
(if) the larger number, if the sum of these numbers is 71.

Solution:

Difference of two numbers = 15

Let smaller number = x

$\therefore$ Second number = $x + 15$

$\therefore$ Larger number = $x + 15$

If sum of two numbers = 71

Then $x + x + 15 = 71$

(i) $2x + 15 = 71$

$\Rightarrow 2x = 71 - 15 = 56$

$$x = \frac{56}{2} = 28$$

(ii) Larger number = $x + 15 = 28 + 15 = 43$

Question 18.

The difference between two numbers is 23. Taking the larger number as x, find:
(i) the expression for smaller number.
(ii) the smaller number, if the sum of these two numbers is 91.

Solution:

Difference between two numbers = 23

Larger number = x

(i) Then smaller number = $x - 23$

(ii) $\because$ Sum of two numbers = 91

Then $x + x - 23 = 91$

$\Rightarrow 2x - 23 = 91$

$\Rightarrow 2x = 91 + 23 = 114$

$$\Rightarrow x = \frac{114}{2} = 57$$

$\therefore$ Smaller number = $x - 23 = 57 - 23 = 34$

Question 19.

Find three consecutive integers such that their sum is 78.

Solution:

Sum of three consecutive numbers = 78
Let first number = x
Then second number = x + 1
and third number = x + 2
Then x + x+1+x + 2 = 78
⇒ 3x + 3 = 78
⇒ 3x = 78 – 3 = 75

$\Rightarrow x = \frac{75}{3} = 25$
∴First number=25
Second number = 25 + 1 = 26
and third number = 26 + 1 = 27
Then the three required numbers are 25, 26,27

Question 20.
The sum of three consecutive numbers is 54. Taking the middle number as x, find:
(i) expression for the smallest number and the largest number.
(ii) the three numbers.
Solution:
Sum of three consecutive numbers = 54
Middle number = x
(i) The first number = x – 1
and third number = x + 1
(ii) ∴x + x-1+x+1 = 54
$\Rightarrow$ 3x = 54
$\Rightarrow x = \frac{54}{3} = 18$
∴First number =18-1 = 17
and third number =18 + 1 = 19
∴Three required numbers are 17, 18,19

REVISION EXERCISE

Question 1.
Solve each of the following equations :
Question i.
2x + 3 = 7
Solution:

$2x + 3 = 7 \Rightarrow 2x + 3 - 3 = 7 - 3$
(Subtracting 3 from both sides)

$\Rightarrow 2x = 4$

$\Rightarrow \frac{2x}{2} = \frac{4}{2}$ (Dividing by 2)

$\Rightarrow x = 2$

$\therefore x = 2$

Question ii.
2x – 3 = 7

Solution:

$2x - 3 = 7$

$\Rightarrow 2x - 3 + 3 = 7 + 3$

(Adding 3 to both sides)

$\Rightarrow 2x = 10$

$\Rightarrow \frac{2x}{2} = \frac{10}{2}$ (Dividing by 2)

$\therefore x = 5$

Question iii.

2x ÷ 3 = 7

Solution:

$2x \div 3 = 7$

$\Rightarrow \frac{2x}{3} = 7 \Rightarrow \frac{2x}{3} \times 3 = 7 \times 3$

(Muyltiplying by 3)

$\Rightarrow 2x = 21$

$\Rightarrow \frac{2x}{2} = \frac{21}{2}$ (Dividing by 2)

$\therefore x = \frac{21}{2} = 10\frac{1}{2}$

Question iv.

3x – 8 = 13

Solution:

$3y - 8 = 13$

$\Rightarrow 3y - 8 + 8 = 13 + 8$

(Adding 8 to both sides)

$\Rightarrow 3y = 21$

$\Rightarrow \frac{3y}{3} = \frac{21}{3}$ (Dividing by 3)

$\therefore y = 7$

Question v.

3y + 8 = 13

Solution:

$3y + 8 = 13$

$\Rightarrow 3y + 8 - 8 = 13 - 8$

(Subtracting 8 from both sides)

$\Rightarrow 3y = 5$

$\Rightarrow \frac{3y}{3} = \frac{5}{3}$ (Dividing by 3)

$\therefore y = \frac{5}{3} = 1\frac{2}{3}$

Question vi.

3y ÷ 8 = 13

Solution:

$3y \div 8 = 13$

$\Rightarrow \frac{3y}{8} = 13$

$\Rightarrow \frac{3y}{8} \times 8 = 13 \times 8$ (Multiplying by 8)

$\Rightarrow 3y = 104$

$\Rightarrow \frac{3y}{3} = \frac{104}{3}$ (Dividing by 3)

$\therefore y = \frac{104}{3} = 34\frac{2}{3}$

Question vii.

$x - 3 = 5\frac{1}{2}$

Solution:

$$x - 3 = 5\frac{1}{2}$$

$$\Rightarrow x - 3 + 3 = 5\frac{1}{2} + 3$$

(Adding 3 to both sides)

$$\therefore x = 8\frac{1}{2}$$

Question viii.

$$\frac{3}{5}x + 4 = 13$$

Solution:

$$\frac{3}{5}x + 4 = 13$$

$$\Rightarrow \frac{3}{5}x + 4 - 4 = 13 - 4$$

(Subtracting 4 from both sides)

$$\Rightarrow \frac{3}{5}x = 9$$

$$\Rightarrow \frac{3}{5}x \times \frac{5}{3} = 9 \times \frac{5}{3} \quad \left(\text{Multiplying by } \frac{5}{3}\right)$$

$$x = 15$$

Question ix.

$$u + 3\frac{1}{4} = 4\frac{1}{3}$$

Solution:

$$u + 3\frac{1}{4} = 4\frac{1}{3}$$

$$\Rightarrow u + \frac{13}{4} = \frac{13}{3}$$

$$\Rightarrow u + \frac{13}{4} - \frac{13}{4} = \frac{13}{3} - \frac{13}{4}$$

(Subtracting $\frac{13}{4}$ from both sides)

$$\Rightarrow u = \frac{52-39}{12} = \frac{13}{12}$$

$$\therefore u = \frac{13}{12} = 1\frac{1}{12}$$

Question x.

5x – 2.4 = 4.9

Solution:

$$5x - 2.4 = 4.9$$

$$\Rightarrow 5x - 2.4 + 2.4 = 4.9 + 2.4$$

(Adding 2.4 to both sides)

$$\Rightarrow 5x = 7.3$$

$$\Rightarrow \frac{5x}{5} = \frac{7.3}{5}$$ (Dividing by 5)

$$\therefore x = 1.46$$

Question xi.

5y + 4.9 = 2.4

Solution:

$$5y + 4.9 = 2.4$$

$$\Rightarrow 5y + 4.9 - 4.9 = 2.4 - 4.9$$

(Subtracting 4.9 from both sides)

$$\Rightarrow 5y = -2.5$$

$$\Rightarrow \frac{5y}{5} = \frac{2.5}{2}$$ (Dividing by 5)

$$\therefore y = -0.5$$

Question xii.

48 z + 3.6 = 1.2

Solution:

$$4.8z + 3.6 = 1.2$$

$$\Rightarrow 4.8z + 3.6 - 3.6 = 1.2 - 3.6$$

(Subtracting 3.6 from both sides)

$$\Rightarrow 4.8z = -2.4$$

$$\Rightarrow \frac{4.8z}{4.8} = \frac{-2.4}{4.8}$$ (Dividing by 4.8)

$$\therefore z = \frac{-1}{2} = -0.5$$

Question xiii.

$$\frac{x}{2} - 3 = 5$$

Solution:

$$\frac{x}{2} - 3 = 5$$

$$\Rightarrow \frac{x}{2} - 3 + 3 = 5 + 3$$

(Adding 3 to both sides)

$$\Rightarrow \frac{x}{2} = 8$$

$$\Rightarrow \frac{x}{2} \times 2 = 8 \times 2$$ (Multiplying by 2)

$$\therefore x = 16$$

Question xiv.

$$\frac{y}{3} + 7 = 2$$

Solution:

$$\frac{y}{3} + 7 = 2$$

$$\Rightarrow \frac{y}{3} + 7 - 7 = 2 - 7$$

(Subtracting 7 from both sides)

$$\Rightarrow \frac{y}{3} = -5$$

$$\Rightarrow \frac{y}{3} \times 3 = -5 \times 3 \qquad \text{(Multiplying by 3)}$$

$$\therefore y = -15$$

Question xv.

$$\frac{2m}{3} = 8\frac{2}{3}$$

Solution:

$$\frac{2m}{3} = 8\frac{2}{3} = \frac{26}{3}$$

$$\Rightarrow \frac{2m}{3} \times \frac{3}{2} = \frac{26}{3} \times \frac{3}{2} \left(\text{Multiplying by } \frac{3}{2}\right)$$

$$\therefore m = 13$$

Question xvi.

-3x + 4 = 10

Solution:

$$-3x + 4 = 10$$

$$\Rightarrow -3x + 4 - 4 = 10 - 4$$

(Subtracting 4 from both sides)

$$\Rightarrow -3x = 6$$

$$\Rightarrow \frac{-3x}{-3} = \frac{6}{-3} \qquad \text{(Dividing by } -3\text{)}$$

$$\therefore x = -2$$

Question xvii.

5 = x – 3

Solution:

$5 = x - 3$

$\Rightarrow 5 + 3 = x - 3 + 3$ (Adding 3 to both sides)

$\Rightarrow 8 = x$

$\therefore x = 8$

Question xviii.

8y = 3- 3y

Solution:

$18 = 3 - 3y$

$\Rightarrow 18 - 3 = 3 - 3y - 3$

(Subtracting 3 from both sides)

$\Rightarrow 15 = -3y$

$\Rightarrow \frac{15}{-3} = \frac{-3y}{-3}$ (Dividing by –3)

$\Rightarrow -5 = y$

$\therefore y = -5$

Question xix.

4x = 4.9 = 6.5

Solution:

$4x + 4.9 = 6.5$

$\Rightarrow 4x + 4.9 - 4.9 = 6.5 - 4.9$

$\Rightarrow 4x = 1.6$ (Subtracting 4.9 from both sides)

$\Rightarrow \frac{4x}{4} = \frac{1.6}{4}$ (Dividing by 4)

$\Rightarrow x = 0.4$

$\therefore x = 0.4$

Question xx.

3z + 2 = -4

Solution:

$3z + 2 = -4$

$\Rightarrow 3z + 2 - 2 = -4 - 2$

(Subtracting –2 from both sides)

$\Rightarrow 3z = -6$

$\Rightarrow \frac{3z}{3} = \frac{-6}{3}$ (Dividing by 3)

$\therefore z = -2$

Question xxi.

7y -18 = 17

Solution:

$7y - 18 = 17$

$\Rightarrow 7y - 18 + 18 = 17 + 18$

(Adding 18 to both sides)

$\Rightarrow 7y = 35$

$\Rightarrow \frac{7y}{7} = \frac{35}{7}$ (Dividing by 7)

$\therefore y = 5$

Question xxii.

$\frac{x}{1.2} - 6 = 1$

Solution:

$\frac{x}{1.2} - 6 = 1$

$\frac{x}{1.2} - 6 + 6 = 1 + 6$

(Adding 6 to both sides)

$\Rightarrow \frac{x}{1.2} = 7$

$\Rightarrow \frac{x}{1.2} \times 1.2 = 7 \times 1.2$ (Multiplying by 1.2)

$\therefore x = 8.4$

Question xxiii.

$\frac{z}{2.4} + 3.6 = 5.1$

Solution:

$\frac{z}{2.4} + 3.6 = 5.1$

$\Rightarrow \frac{z}{2.4} + 3.6 - 3.6 = 5.1 - 3.6$

(Subtracting 3.6 from both sides)

$\Rightarrow \frac{z}{2.4} = 1.5$

$\Rightarrow \frac{z}{2.4} \times 2.4 = 1.5 \times 2.4$

(Multiplying by 2.4)

$\Rightarrow z = 3.60$

$\therefore z = 3.6$

Question xxiv.

$\frac{y}{1.8} - 2.1 = -2.8$

Solution:

$\frac{y}{1.8} - 2.1 = -2.8$

$\Rightarrow \frac{y}{1.8} - 2.1 + 2.1 = -2.8 + 2.1$

(Adding 2.1 to both sides)

$\Rightarrow \frac{y}{1.8} = -0.7$

$\Rightarrow \frac{y}{1.8} \times 1.8 = -0.7 \times 1.8$

(Multiplying by 1.8)

$\therefore y = -1.26$

Question xxv.

7x -2 = 4x +7

Solution:

$7x - 2 = 4x + 7$

$\Rightarrow 7x - 2 + 2 = 4x + 7 + 2$

(Adding 2 to both sides)

$\Rightarrow 7x = 4x + 9$

$\Rightarrow 7x - 4x = 4x + 9 - 4x$

(Subtracting $4x$ from both sides)

$\Rightarrow 3x = 9$

$\Rightarrow \frac{3x}{3} = \frac{9}{3}$ (Dividing by 3)

$\therefore x = 3$

Question xxvi.

3y -(y -+2) =4

Solution:

$3y - (y + 2) = 4$

$\Rightarrow 3y - y - 2 = 4$

$\Rightarrow 2y - 2 = 4$

$\Rightarrow 2y - 2 + 2 = 4 + 2$

(Adding 2 to both sides)

$\Rightarrow 2y = 6$

$\Rightarrow \frac{2y}{2} = \frac{6}{2}$ (Dividing by 2)

$\Rightarrow y = 3$

$\therefore y = 3$

Question xxvii.

3z – 18 = z – (12 -4z)

Solution:

$3z - 18 = z - (12 - 4z)$

$\Rightarrow 3z - 18 = z - 12 + 4z$

$\Rightarrow 3z - 18 = 5z - 12$

$\Rightarrow 3z - 18 + 18 = 5z - 12 + 18$

(Adding 18 to both sides)

$\Rightarrow 3z = 5z + 6$

$\Rightarrow 3z - 5z = 5z + 6 - 5z$

(Subtracting $5z$ from both sides)

$\Rightarrow -2z = 6$

$\Rightarrow \frac{-2z}{-2} = \frac{6}{-2}$ (Dividing by -2)

$\Rightarrow z = -3$

$\therefore z = -3$

Question xxiii.

$x - 2\frac{1}{3} = 5\frac{1}{2}$

Solution:

$x - 2\frac{1}{3} = 5\frac{1}{2}$

$x - 2\frac{1}{3} + 2\frac{1}{3} = 5\frac{1}{2} + 2\frac{1}{3}$

(Adding $2\frac{1}{3}$ to both sides)

$x = 5\frac{1}{2} + 2\frac{1}{3} = \frac{11}{2} + \frac{7}{3}$

$= \frac{33+14}{6} = \frac{47}{6}$

$= 7\frac{5}{6}$

Question xxix.

$3\frac{2}{5} - y = 2\frac{1}{2}$

Solution:

$$3\frac{2}{5} - y = 2\frac{1}{2}$$

$$\Rightarrow 3\frac{2}{5} - y - 3\frac{2}{5} = 2\frac{1}{2} - 3\frac{2}{5}$$

(Subtracting $3\frac{2}{5}$ from both sides)

$$\Rightarrow -y = \frac{5}{2} - \frac{17}{5}$$

$$= \frac{25-34}{10} = \frac{-9}{10}$$

$$\therefore y = \frac{9}{10}$$

Question xxx.

$$2z - 2\frac{1}{2} = 3\frac{1}{3}$$

Solution:

$$2z - 2\frac{1}{2} = 3\frac{1}{3}$$

$$\Rightarrow 2z - 2\frac{1}{2} + 2\frac{1}{2} = 3\frac{1}{3} + 2\frac{1}{2}$$

(Adding $2\frac{1}{2}$ to both sides)

$$\Rightarrow 2z = \frac{10}{3} + \frac{5}{2}$$

$$= \frac{20+15}{6} = \frac{35}{6}$$

$$\Rightarrow \frac{2z}{2} = \frac{35}{6\times 2}$$ (Dividing by 2)

$$z = \frac{35}{12} = 2\frac{11}{12}$$

Question xxxi.

5x – 2x +15 = 27

Solution:

$5x - 2x + 15 = 27$

$\Rightarrow 3x + 15 = 27$

$\Rightarrow 3x + 15 - 15 = 27 - 15$

(Subtracting 15 from both sides)

$\Rightarrow 3x = 12$

$\Rightarrow \frac{3x}{3} = \frac{12}{3}$ (Dividing by 3)

$\therefore x = 4$

Question xxxii.

5y – 15 = 27 -2y

Solution:

$5y - 15 = 27 - 2y$

$\Rightarrow 5y + 2y - 15 = 27 - 2y + 2y$

(Adding $2y$ to both sides)

$\Rightarrow 7y - 15 = 27$

$\Rightarrow 7y - 15 + 15 = 27 + 15$

(Adding 15 to both sides)

$\Rightarrow 7y = 42$

$\Rightarrow \frac{7y}{7} = \frac{42}{7}$ (Dividing by 7)

$\therefore y = 6$

Question xxxiii.

7z + 15 = 3z – 13

Solution:

$7z + 15 = 3z - 13$

$\Rightarrow 7z + 15 - 3z = 3z - 13 - 3z$

(Subtracting $3z$ from both sides)

$\Rightarrow 4z + 15 = -13$

$\Rightarrow 4z + 15 - 15 = -13 - 15$

(Subtracting 15 from both sides)

$\Rightarrow 4z = -28$

$\Rightarrow \frac{4z}{4} = \frac{-28}{4}$ (Dividing by 4)

$z = -7$

Question xxxiv.

2 (x -3) – 3 (x-4) =12

Solution:

$$2(x-3)-3(x-4)=12$$

$$\Rightarrow 2x-6-3x+12=12$$

$$\Rightarrow -x+6=12$$

$$\Rightarrow -x+6-6=12-6$$

(Subtracting 6 from both sides)

$$\Rightarrow -x=6$$

$$\therefore x=-6$$

Question xxxv.

(7y +8) +7= 8

Solution:

$$(7y+8)\div 7=8$$

$$\Rightarrow \frac{7y+8}{7}=8$$

$$\Rightarrow \frac{(7y+8)}{7}\times 7=8\times 7$$ (Multiplying by 7)

$$\Rightarrow 7y+8=56$$

$$\Rightarrow 7y+8-8=56-8$$

(Subtracting 8 from both sides)

$$\Rightarrow 7y=48$$

$$\Rightarrow \frac{7y}{7}=\frac{48}{7}$$ (Dividing by 7)

$$y=\frac{48}{7}=6\frac{6}{7}$$

Question xxxvi.

2(z-5) +3 (z+2) -(3-5z) =10

Solution:

$2(z-5)+3(z+2)-(3-5z)=10$

$\Rightarrow 2z-10+3z+6-3+5z=10$

$\Rightarrow 10z-7=10$

$\Rightarrow 10z-7+7=10+7$ (Adding 7 to both sides)

$\Rightarrow 10z=17$

$\Rightarrow \frac{10z}{10}=\frac{17}{10}$ (Dividing by 10)

$z=\frac{17}{10}=1\frac{7}{10}$

Question 2.

A natural number decreased by 7 is 12. Find the number.

Solution:

Let the required number $= x$

Then $x-7=12$

$\Rightarrow x-7+7=12+7$ (Adding 7 to both sides)

$x=19$

$\therefore$ Required number $= 19$

Question 3.

One-fourth of a number added to one-sixth of It is 15. Find the number.

Solution:

Let the required number $= x$

The $\frac{x}{4}+\frac{x}{6}=15$

$=\frac{3x+2x}{12}=15$

$\Rightarrow \frac{5x}{12}=15 \Rightarrow x=\frac{15\times 12}{5}$

$\Rightarrow x=36$

$\therefore$ Required number $= 36$

Question 4.

A whole number is increased by 7 and the number so obtained is multiplied by 5;

the result is 45. Find the whole number.

Solution:

Let the required whole number = x

Then $(x + 7) \times 5 = 45$

$\Rightarrow \frac{(x+7)\times 5}{5} = \frac{45}{5}$ (Dividing by 5)

$\Rightarrow x + 7 = 9$

$\Rightarrow x = 9 - 7$

$x = 2$

$\therefore$ Required whole number = 2

Question 5.

The age of a man and the age of his daughter differ by 23 years and the sum of their ages is 41 years. Find the age of the man.

Solution:

Let age of daughter = x years

Then age of man = $(x + 23)$

$\therefore x + (x + 23) = 41$

$x + x + 23 = 41 \Rightarrow 2x + 23 = 41$

$\Rightarrow 2x = 41 - 23 = 18$

$\Rightarrow x = \frac{18}{2} = 9$

$\therefore$ Age of man = $x + 23 = 9 + 23 = 32$ years

Question 6.

The difference between the ages of a woman and her son is 19 years and the sum of their ages is 37 years; find the age of the son.

Solution:

Let age of son = x years

The age of woman = $x + 19$

$\therefore x + x + 19 = 37$

$\Rightarrow 2x + 19 = 37$

$\Rightarrow 2x = 37 - 19 = 18$

$\Rightarrow x = \frac{18}{2} = 9$

$\therefore$ Age of son = 9 years

Question 7.

Two natural numbers differ by 6 and their sum is 36. Find the larger number.

Solution:

$\because$ Difference between two numbers = 6

and their sum = 36

Let first natural number = x

The second number = $x - 6$

$\therefore\ x + x - 6 = 36$

$\Rightarrow\ 2x = 36 + 6 = 42$

$$x = \frac{42}{2} = 21$$

$\therefore$ Larger number = 21

Question 8.

The difference between two numbers is 15. Taking the smaller number as x; find :

(i) the expression for the larger number.

(ii) the larger number, if the sum of these numbers is 71.

Solution:

Difference of two numbers = 15

Let smaller number = x

$\therefore$ Second number = $x + 15$

$\therefore$ Larger number = $x + 15$

If sum of two numbers = 71

Then $x + x + 15 = 71$

$(i)\ 2x + 15 = 71$

$\Rightarrow\ 2x = 71 - 15 = 56$

$$x = \frac{56}{2} = 28$$

(ii) Larger number = $x + 15 = 28 + 15 = 43$

Question 9.

The difference between two numbers is 23. Taking the larger number as x, find :

(i) the expression for smaller number.

(ii) the smaller number, if the sum of these two numbers is 91.

Solution: