

## EXERCISE 4.1

PAGE: 81

1. Complete the last column of the table.

S. No.	Equation	Value	Say whether the equation is satisfied. (Yes/No)
(i)	$x + 3 = 0$	$x = 3$	
(ii)	$x + 3 = 0$	$x = 0$	
(iii)	$x + 3 = 0$	$x = -3$	
(iv)	$x - 7 = 1$	$x = 7$	
(v)	$x - 7 = 1$	$x = 8$	
(vi)	$5x = 25$	$x = 0$	
(vii)	$5x = 25$	$x = 5$	
(viii)	$5x = 25$	$x = -5$	
(ix)	$(m/3) = 2$	$m = -6$	
(x)	$(m/3) = 2$	$m = 0$	

(xi)	$(m/3) = 2$	$m = 6$	
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**Solution:**

(i)  $x + 3 = 0$

LHS =  $x + 3$

By substituting the value of  $x = 3$

Then,

LHS =  $3 + 3 = 6$

By comparing LHS and RHS,

LHS  $\neq$  RHS

$\therefore$  No, the equation is not satisfied.

(ii)  $x + 3 = 0$

LHS =  $x + 3$

By substituting the value of  $x = 0$ ,

Then,

LHS =  $0 + 3 = 3$

By comparing LHS and RHS,

LHS  $\neq$  RHS

$\therefore$  No, the equation is not satisfied.

(iii)  $x + 3 = 0$

LHS =  $x + 3$

By substituting the value of  $x = -3$ ,

Then,

LHS =  $-3 + 3 = 0$

By comparing LHS and RHS,

LHS = RHS

$\therefore$  Yes, the equation is satisfied.

(iv)  $x - 7 = 1$

LHS =  $x - 7$

By substituting the value of  $x = 7$ ,

Then,

LHS =  $7 - 7 = 0$

By comparing LHS and RHS,

LHS  $\neq$  RHS

$\therefore$  No, the equation is not satisfied.

(v)  $x - 7 = 1$

LHS =  $x - 7$

By substituting the value of  $x = 8$ ,

Then,

LHS =  $8 - 7 = 1$

By comparing LHS and RHS,

LHS = RHS

$\therefore$  Yes, the equation is satisfied.

(vi)  $5x = 25$

LHS =  $5x$

By substituting the value of  $x = 0$ ,

Then,

LHS =  $5 \times 0 = 0$

By comparing LHS and RHS,

LHS  $\neq$  RHS

$\therefore$  No, the equation is not satisfied.

(vii)  $5x = 25$

LHS =  $5x$

By substituting the value of  $x = 5$ ,

Then,

$$\text{LHS} = 5 \times 5 = 25$$

By comparing LHS and RHS,

$$\text{LHS} = \text{RHS}$$

$\therefore$  Yes, the equation is satisfied.

(viii)  $5x = 25$

$$\text{LHS} = 5x$$

By substituting the value of  $x = -5$ ,

Then,

$$\text{LHS} = 5 \times (-5) = -25$$

By comparing LHS and RHS,

$$\text{LHS} \neq \text{RHS}$$

$\therefore$  No, the equation is not satisfied.

(ix)  $m/3 = 2$

$$\text{LHS} = m/3$$

By substituting the value of  $m = -6$ ,

Then,

$$\text{LHS} = -6/3 = -2$$

By comparing LHS and RHS,

$$\text{LHS} \neq \text{RHS}$$

$\therefore$  No, the equation is not satisfied.

(x)  $m/3 = 2$

$$\text{LHS} = m/3$$

By substituting the value of  $m = 0$ ,

Then,

$$\text{LHS} = 0/3 = 0$$

By comparing LHS and RHS,

$$\text{LHS} \neq \text{RHS}$$

$\therefore$  No, the equation is not satisfied.

$$\text{(xi) } m/3 = 2$$

$$\text{LHS} = m/3$$

By substituting the value of  $m = 6$ ,

Then,

$$\text{LHS} = 6/3 = 2$$

By comparing LHS and RHS,

$$\text{LHS} = \text{RHS}$$

$\therefore$  Yes, the equation is satisfied.

S. No.	Equation	Value	Say whether the equation is satisfied. (Yes/No)
(i)	$x + 3 = 0$	$x = 3$	No
(ii)	$x + 3 = 0$	$x = 0$	No
(iii)	$x + 3 = 0$	$x = -3$	Yes
(iv)	$x - 7 = 1$	$x = 7$	No
(v)	$x - 7 = 1$	$x = 8$	Yes
(vi)	$5x = 25$	$x = 0$	No

(vii)	$5x = 25$	$x = 5$	Yes
(viii)	$5x = 25$	$x = -5$	No
(ix)	$(m/3) = 2$	$m = -6$	No
(x)	$(m/3) = 2$	$m = 0$	No
(xi)	$(m/3) = 2$	$m = 6$	Yes

2. Check whether the value given in the brackets is a solution to the given equation or not.

(a)  $n + 5 = 19$  ( $n = 1$ )

**Solution:**

$$\text{LHS} = n + 5$$

By substituting the value of  $n = 1$ ,

Then,

$$\text{LHS} = n + 5$$

$$= 1 + 5$$

$$= 6$$

By comparing LHS and RHS,

$$6 \neq 19$$

$$\text{LHS} \neq \text{RHS}$$

Hence, the value of  $n = 1$  is not a solution to the given equation  $n + 5 = 19$ .

(b)  $7n + 5 = 19$  ( $n = -2$ )

**Solution:**

$$\text{LHS} = 7n + 5$$

By substituting the value of  $n = -2$ ,

Then,

$$\begin{aligned}\text{LHS} &= 7n + 5 \\ &= (7 \times (-2)) + 5 \\ &= -14 + 5 \\ &= -9\end{aligned}$$

By comparing LHS and RHS,

$$-9 \neq 19$$

$$\text{LHS} \neq \text{RHS}$$

Hence, the value of  $n = -2$  is not a solution to the given equation  $7n + 5 = 19$ .

**(c)  $7n + 5 = 19$  ( $n = 2$ )**

**Solution:**

$$\text{LHS} = 7n + 5$$

By substituting the value of  $n = 2$ ,

Then,

$$\begin{aligned}\text{LHS} &= 7n + 5 \\ &= (7 \times (2)) + 5 \\ &= 14 + 5 \\ &= 19\end{aligned}$$

By comparing LHS and RHS,

$$19 = 19$$

$$\text{LHS} = \text{RHS}$$

Hence, the value of  $n = 2$  is a solution to the given equation  $7n + 5 = 19$ .

**(d)  $4p - 3 = 13$  ( $p = 1$ )**

**Solution:**

$$\text{LHS} = 4p - 3$$

By substituting the value of  $p = 1$ ,

Then,

$$\text{LHS} = 4p - 3$$

$$= (4 \times 1) - 3$$

$$= 4 - 3$$

$$= 1$$

By comparing LHS and RHS,

$$1 \neq 13$$

$$\text{LHS} \neq \text{RHS}$$

Hence, the value of  $p = 1$  is not a solution to the given equation  $4p - 3 = 13$ .

**(e)  $4p - 3 = 13$  ( $p = -4$ )**

**Solution:**

$$\text{LHS} = 4p - 3$$

By substituting the value of  $p = -4$ ,

Then,

$$\text{LHS} = 4p - 3$$

$$= (4 \times (-4)) - 3$$

$$= -16 - 3$$

$$= -19$$

By comparing LHS and RHS,

$$-19 \neq 13$$

$$\text{LHS} \neq \text{RHS}$$

Hence, the value of  $p = -4$  is not a solution to the given equation  $4p - 3 = 13$ .

**(f)  $4p - 3 = 13$  ( $p = 0$ )**

**Solution:**

$$\text{LHS} = 4p - 3$$

By substituting the value of  $p = 0$ ,

Then,



$$\text{LHS} = 4p - 3$$

$$= (4 \times 0) - 3$$

$$= 0 - 3$$

$$= -3$$

By comparing LHS and RHS,

$$-3 \neq 13$$

$$\text{LHS} \neq \text{RHS}$$

Hence, the value of  $p = 0$  is not a solution to the given equation  $4p - 3 = 13$ .

### 3. Solve the following equations by trial and error method.

(i)  $5p + 2 = 17$

**Solution:**

$$\text{LHS} = 5p + 2$$

By substituting the value of  $p = 0$ ,

Then,

$$\text{LHS} = 5p + 2$$

$$= (5 \times 0) + 2$$

$$= 0 + 2$$

$$= 2$$

By comparing LHS and RHS,

$$2 \neq 17$$

$$\text{LHS} \neq \text{RHS}$$

Hence, the value of  $p = 0$  is not a solution to the given equation.

Let,  $p = 1$

$$\text{LHS} = 5p + 2$$

$$= (5 \times 1) + 2$$

$$= 5 + 2$$

$$= 7$$

By comparing LHS and RHS,

$$7 \neq 17$$

$$\text{LHS} \neq \text{RHS}$$

Hence, the value of  $p = 1$  is not a solution to the given equation.

Let,  $p = 2$

$$\text{LHS} = 5p + 2$$

$$= (5 \times 2) + 2$$

$$= 10 + 2$$

$$= 12$$

By comparing LHS and RHS,

$$12 \neq 17$$

$$\text{LHS} \neq \text{RHS}$$

Hence, the value of  $p = 2$  is not a solution to the given equation.

Let,  $p = 3$

$$\text{LHS} = 5p + 2$$

$$= (5 \times 3) + 2$$

$$= 15 + 2$$

$$= 17$$

By comparing LHS and RHS,

$$17 = 17$$

$$\text{LHS} = \text{RHS}$$

Hence, the value of  $p = 3$  is a solution to the given equation.

**(ii)  $3m - 14 = 4$**

**Solution:**

$$\text{LHS} = 3m - 14$$

By substituting the value of  $m = 3$ ,

Then,

$$\text{LHS} = 3m - 14$$

$$= (3 \times 3) - 14$$

$$= 9 - 14$$

$$= -5$$

By comparing LHS and RHS,

$$-5 \neq 4$$

$$\text{LHS} \neq \text{RHS}$$

Hence, the value of  $m = 3$  is not a solution to the given equation.

Let,  $m = 4$

$$\text{LHS} = 3m - 14$$

$$= (3 \times 4) - 14$$

$$= 12 - 14$$

$$= -2$$

By comparing LHS and RHS,

$$-2 \neq 4$$

$$\text{LHS} \neq \text{RHS}$$

Hence, the value of  $m = 4$  is not a solution to the given equation.

Let,  $m = 5$

$$\text{LHS} = 3m - 14$$

$$= (3 \times 5) - 14$$

$$= 15 - 14$$

$$= 1$$

By comparing LHS and RHS,

$$1 \neq 4$$

$$\text{LHS} \neq \text{RHS}$$

Hence, the value of  $m = 5$  is not a solution to the given equation.

$$\text{Let, } m = 6$$

$$\text{LHS} = 3m - 14$$

$$= (3 \times 6) - 14$$

$$= 18 - 14$$

$$= 4$$

By comparing LHS and RHS,

$$4 = 4$$

$$\text{LHS} = \text{RHS}$$

Hence, the value of  $m = 6$  is a solution to the given equation.

#### 4. Write equations for the following statements.

(i) The sum of numbers  $x$  and 4 is 9.

**Solution:**

The above statement can be written in the equation form as,

$$= x + 4 = 9$$

(ii) 2 subtracted from  $y$  is 8.

**Solution:**

The above statement can be written in the equation form as,

$$= y - 2 = 8$$

(iii) Ten times  $a$  is 70.

**Solution:**

The above statement can be written in the equation form as,

$$= 10a = 70$$

(iv) The number  $b$  divided by 5 gives 6.

**Solution:**

The above statement can be written in the equation form as,

$$= (b/5) = 6$$

**(v) Three-fourths of t is 15.**

**Solution:**

The above statement can be written in the equation form as,

$$= \frac{3}{4}t = 15$$

**(vi) Seven times m plus 7 gets you 77.**

**Solution:**

The above statement can be written in the equation form as,

Seven times m is 7m.

$$= 7m + 7 = 77$$

**(vii) One-fourth of a number x minus 4 gives 4.**

**Solution:**

The above statement can be written in the equation form as,

One-fourth of a number x is  $x/4$ .

$$= x/4 - 4 = 4$$

**(viii) If you take away 6 from 6 times y, you get 60.**

**Solution:**

The above statement can be written in the equation form as,

6 times y is 6y.

$$= 6y - 6 = 60$$

**(ix) If you add 3 to one-third of z, you get 30.**

**Solution:**

The above statement can be written in the equation form as,

One-third of z is  $z/3$ .

$$= 3 + z/3 = 30$$

5. Write the following equations in statement forms.

(i)  $p + 4 = 15$

**Solution:**

The sum of numbers  $p$  and 4 is 15.

(ii)  $m - 7 = 3$

**Solution:**

7 subtracted from  $m$  is 3.

(iii)  $2m = 7$

**Solution:**

Twice of number  $m$  is 7.

(iv)  $m/5 = 3$

**Solution:**

The number  $m$  divided by 5 gives 3.

(v)  $(3m)/5 = 6$

**Solution:**

Three-fifth of  $m$  is 6.

(vi)  $3p + 4 = 25$

**Solution:**

Three times  $p$  plus 4 gives you 25.

(vii)  $4p - 2 = 18$

**Solution:**

Four times  $p$  minus 2 gives you 18.

(viii)  $p/2 + 2 = 8$

**Solution:**

If you add half of a number  $p$  to 2, you get 8.

**6. Set up an equation in the following cases.**

**(i) Irfan says that he has 7 marbles, more than five times the marbles Parmit has. Irfan has 37 marbles (Take  $m$  to be the number of Parmit's marbles).**

**Solution:**

From the question, it is given that

Number of Parmit's marbles =  $m$

Then,

Irfan has 7 marbles, more than five times the marbles Parmit has.

$= 5 \times \text{Number of Parmit's marbles} + 7 = \text{Total number of marbles Irfan having}$

$$= (5 \times m) + 7 = 37$$

$$= 5m + 7 = 37$$

**(ii) Laxmi's father is 49 years old. He is 4 years older than three times Laxmi's age (Take Laxmi's age to be  $y$  years).**

**Solution:**

From the question, it is given that

Let Laxmi's age be =  $y$  years old

Then,

Lakshmi's father is 4 years older than three times her age.

$= 3 \times \text{Laxmi's age} + 4 = \text{Age of Lakshmi's father}$

$$= (3 \times y) + 4 = 49$$

$$= 3y + 4 = 49$$

**(iii) The teacher tells the class that the highest marks obtained by a student in her class are twice the lowest marks plus 7. The highest score is 87 (Take the lowest score to be  $l$ ).**

**Solution:**

From the question, it is given that

Highest score in the class = 87

Let the lowest score be  $l$ .

$$= 2 \times \text{Lowest score} + 7 = \text{Highest score in the class}$$

$$= (2 \times 1) + 7 = 87$$

$$= 21 + 7 = 87$$

**(iv) In an isosceles triangle, the vertex angle is twice either base angle (Let the base angle be  $b$  in degrees. Remember that the sum of angles of a triangle is 180 degrees).**

**Solution:**

From the question, it is given that

We know that the sum of angles of a triangle is  $180^\circ$

Let the base angle be  $b$ .

Then,

$$\text{Vertex angle} = 2 \times \text{base angle} = 2b$$

$$= b + b + 2b = 180^\circ$$

$$= 4b = 180^\circ$$



## EXERCISE 4.2

PAGE: 86

1. Give first the step you will use to separate the variable and then solve the equation.

(a)  $x - 1 = 0$

**Solution:**

We have to add 1 to both sides of the given equation.

Then, we get

$$= x - 1 + 1 = 0 + 1$$

$$= x = 1$$

(b)  $x + 1 = 0$

**Solution:**

We have to subtract 1 from both sides of the given equation.

Then, we get

$$= x + 1 - 1 = 0 - 1$$

$$= x = -1$$

(c)  $x - 1 = 5$

**Solution:**

We have to add 1 to both sides of the given equation.

Then, we get

$$= x - 1 + 1 = 5 + 1$$

$$= x = 6$$

(d)  $x + 6 = 2$

**Solution:**

We have to subtract 6 from both sides of the given equation.

Then, we get

$$= x + 6 - 6 = 2 - 6$$

$$= x = -4$$

**(e)  $y - 4 = -7$**

**Solution:**

We have to add 4 to both sides of the given equation.

Then, we get

$$= y - 4 + 4 = -7 + 4$$

$$= y = -3$$

**(f)  $y - 4 = 4$**

**Solution:**

We have to add 4 to both sides of the given equation.

Then, we get

$$= y - 4 + 4 = 4 + 4$$

$$= y = 8$$

**(g)  $y + 4 = 4$**

**Solution:**

We have to subtract 4 from both sides of the given equation.

Then, we get

$$= y + 4 - 4 = 4 - 4$$

$$= y = 0$$

**(h)  $y + 4 = -4$**

**Solution:**

We have to subtract 4 from both sides of the given equation.

Then, we get

$$= y + 4 - 4 = -4 - 4$$

$$= y = -8$$

2. Give first the step you will use to separate the variable and then solve the equation.

(a)  $3l = 42$

**Solution:**

Now, we have to divide both sides of the equation by 3.

Then, we get

$$= 3l/3 = 42/3$$

$$= l = 14$$

(b)  $b/2 = 6$

**Solution:**

Now, we have to multiply both sides of the equation by 2.

Then, we get

$$= b/2 \times 2 = 6 \times 2$$

$$= b = 12$$

(c)  $p/7 = 4$

**Solution:**

Now, we have to multiply both sides of the equation by 7.

Then, we get

$$= p/7 \times 7 = 4 \times 7$$

$$= p = 28$$

(d)  $4x = 25$

**Solution:**

Now, we have to divide both sides of the equation by 4

Then, we get

$$= 4x/4 = 25/4$$

$$= x = 25/4$$

(e)  $8y = 36$

**Solution:**

Now, we have to divide both sides of the equation by 8.

Then, we get

$$= 8y/8 = 36/8$$

$$= x = 9/2$$

**(f)  $(z/3) = (5/4)$**

**Solution:**

Now, we have to multiply both sides of the equation by 3.

Then, we get

$$= (z/3) \times 3 = (5/4) \times 3$$

$$= x = 15/4$$

**(g)  $(a/5) = (7/15)$**

**Solution:**

Now, we have to multiply both sides of the equation by 5.

Then, we get

$$= (a/5) \times 5 = (7/15) \times 5$$

$$= a = 7/3$$

**(h)  $20t = -10$**

**Solution:**

Now, we have to divide both sides of the equation by 20.

Then, we get

$$= 20t/20 = -10/20$$

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

**3. Give the steps you will use to separate the variable and then solve the equation.**

**(a)  $3n - 2 = 46$**

**Solution:**

First, we have to add 2 to both sides of the equation.

Then, we get

$$= 3n - 2 + 2 = 46 + 2$$

$$= 3n = 48$$

Now,

We have to divide both sides of the equation by 3.

Then, we get

$$= 3n/3 = 48/3$$

$$= n = 16$$

**(b)  $5m + 7 = 17$**

**Solution:**

First, we have to subtract 7 from both sides of the equation.

Then, we get

$$= 5m + 7 - 7 = 17 - 7$$

$$= 5m = 10$$

Now,

We have to divide both sides of the equation by 5.

Then, we get

$$= 5m/5 = 10/5$$

$$= m = 2$$

**(c)  $20p/3 = 40$**

**Solution:**

First, we have to multiply both sides of the equation by 3.

Then, we get

$$= (20p/3) \times 3 = 40 \times 3$$

$$= 20p = 120$$

Now,

We have to divide both sides of the equation by 20.

Then, we get

$$= 20p/20 = 120/20$$

$$= p = 6$$

**(d)  $3p/10 = 6$**

**Solution:**

First, we have to multiply both sides of the equation by 10.

Then, we get

$$= (3p/10) \times 10 = 6 \times 10$$

$$= 3p = 60$$

Now,

We have to divide both sides of the equation by 3.

Then, we get

$$= 3p/3 = 60/3$$

$$= p = 20$$

**4. Solve the following equations.**

**(a)  $10p = 100$**

**Solution:**

Now,

We have to divide both sides of the equation by 10.

Then, we get

$$= 10p/10 = 100/10$$

$$= p = 10$$

**(b)  $10p + 10 = 100$**

**Solution:**

First, we have to subtract 10 from both sides of the equation.

Then, we get

$$= 10p + 10 - 10 = 100 - 10$$

$$= 10p = 90$$

Now,

We have to divide both sides of the equation by 10.

Then, we get

$$= 10p/10 = 90/10$$

$$= p = 9$$

**(c)  $p/4 = 5$**

**Solution:**

Now,

We have to multiply both sides of the equation by 4.

Then, we get

$$= p/4 \times 4 = 5 \times 4$$

$$= p = 20$$

**(d)  $-p/3 = 5$**

**Solution:**

Now,

We have to multiply both sides of the equation by  $-3$ .

Then, we get

$$= -p/3 \times (-3) = 5 \times (-3)$$

$$= p = -15$$

**(e)  $3p/4 = 6$**

**Solution:**

First, we have to multiply both sides of the equation by 4.

Then, we get

$$= (3p/4) \times (4) = 6 \times 4$$

$$= 3p = 24$$

Now,

We have to divide both sides of the equation by 3.

Then, we get

$$= 3p/3 = 24/3$$

$$= p = 8$$

**(f)  $3s = -9$**

**Solution:**

Now,

We have to divide both sides of the equation by 3.

Then, we get

$$= 3s/3 = -9/3$$

$$= s = -3$$

**(g)  $3s + 12 = 0$**

**Solution:**

First, we have to subtract 12 from both sides of the equation.

Then, we get

$$= 3s + 12 - 12 = 0 - 12$$

$$= 3s = -12$$

Now,

We have to divide both sides of the equation by 3.

Then, we get

$$= 3s/3 = -12/3$$

$$= s = -4$$



**(h)  $3s = 0$**

**Solution:**

Now,

We have to divide both sides of the equation by 3.

Then, we get

$$= 3s/3 = 0/3$$

$$= s = 0$$

**(i)  $2q = 6$**

**Solution:**

Now,

We have to divide both sides of the equation by 2.

Then, we get

$$= 2q/2 = 6/2$$

$$= q = 3$$

**(j)  $2q - 6 = 0$**

**Solution:**

First, we have to add 6 to both sides of the equation.

Then, we get

$$= 2q - 6 + 6 = 0 + 6$$

$$= 2q = 6$$

Now,

We have to divide both sides of the equation by 2.

Then, we get

$$= 2q/2 = 6/2$$

$$= q = 3$$

**(k)  $2q + 6 = 0$**

**Solution:**

First, we have to subtract 6 from both sides of the equation.

Then, we get

$$= 2q + 6 - 6 = 0 - 6$$

$$= 2q = -6$$

Now,

We have to divide both sides of the equation by 2.

Then, we get

$$= 2q/2 = -6/2$$

$$= q = -3$$

**(I)  $2q + 6 = 12$**

**Solution:**

First, we have to subtract 6 from both sides of the equation.

Then, we get

$$= 2q + 6 - 6 = 12 - 6$$

$$= 2q = 6$$

Now,

We have to divide both sides of the equation by 2.

Then, we get

$$= 2q/2 = 6/2$$

$$= q = 3$$

## EXERCISE 4.3

PAGE: 89

1. Solve the following equations.

(a)  $2y + (5/2) = (37/2)$

**Solution:**

By transposing  $(5/2)$  from LHS to RHS, it becomes  $-5/2$

Then,

$$= 2y = (37/2) - (5/2)$$

$$= 2y = (37-5)/2$$

$$= 2y = 32/2$$

Now,

Divide both sides by 2.

$$= 2y/2 = (32/2)/2$$

$$= y = (32/2) \times (1/2)$$

$$= y = 32/4$$

$$= y = 8$$

(b)  $5t + 28 = 10$

**Solution:**

By transposing 28 from LHS to RHS, it becomes -28

Then,

$$= 5t = 10 - 28$$

$$= 5t = -18$$

Now,

Divide both sides by 5.

$$= 5t/5 = -18/5$$

$$= t = -18/5$$

**(c)  $(a/5) + 3 = 2$**

**Solution:**

By transposing 3 from LHS to RHS, it becomes -3

Then,

$$= a/5 = 2 - 3$$

$$= a/5 = -1$$

Now,

Multiply both sides by 5.

$$= (a/5) \times 5 = -1 \times 5$$

$$= a = -5$$

**(d)  $(q/4) + 7 = 5$**

**Solution:**

By transposing 7 from LHS to RHS, it becomes -7

Then,

$$= q/4 = 5 - 7$$

$$= q/4 = -2$$

Now,

Multiply both sides by 4.

$$= (q/4) \times 4 = -2 \times 4$$

$$= a = -8$$

**(e)  $(5/2) x = -5$**

**Solution:**

First, we have to multiply both sides by 2.

$$= (5x/2) \times 2 = -5 \times 2$$

$$= 5x = -10$$

Now,

We have to divide both sides by 5.

Then, we get

$$= 5x/5 = -10/5$$

$$= x = -2$$

**(f)  $(5/2)x = 25/4$**

**Solution:**

First, we have to multiply both sides by 2.

$$= (5x/2) \times 2 = (25/4) \times 2$$

$$= 5x = (25/2)$$

Now,

We have to divide both sides by 5.

Then, we get

$$= 5x/5 = (25/2)/5$$

$$= x = (25/2) \times (1/5)$$

$$= x = (5/2)$$

**(g)  $7m + (19/2) = 13$**

**Solution:**

By transposing  $(19/2)$  from LHS to RHS, it becomes  $-19/2$

Then,

$$= 7m = 13 - (19/2)$$

$$= 7m = (26 - 19)/2$$

$$= 7m = 7/2$$

Now,

Divide both sides by 7.

$$= 7m/7 = (7/2)/7$$

$$= m = (7/2) \times (1/7)$$

$$= m = 1/2$$

**(h)  $6z + 10 = -2$**

**Solution:**

By transposing 10 from LHS to RHS, it becomes  $-10$

Then,

$$= 6z = -2 - 10$$

$$= 6z = -12$$

Now,

Divide both sides by 6.

$$= 6z/6 = -12/6$$

$$= m = -2$$

**(i)  $(3/2)l = 2/3$**

**Solution:**

First, we have to multiply both sides by 2.

$$= (3l/2) \times 2 = (2/3) \times 2$$

$$= 3l = (4/3)$$

Now,

We have to divide both sides by 3.

Then, we get

$$= 3l/3 = (4/3)/3$$

$$= l = (4/3) \times (1/3)$$

$$= x = (4/9)$$

**(j)  $(2b/3) - 5 = 3$**

**Solution:**

By transposing  $-5$  from LHS to RHS, it becomes  $5$

Then,

$$= 2b/3 = 3 + 5$$

$$= 2b/3 = 8$$

Now,

Multiply both sides by 3.

$$= (2b/3) \times 3 = 8 \times 3$$

$$= 2b = 24$$

And,

Divide both sides by 2.

$$= 2b/2 = 24/2$$

$$= b = 12$$

## 2. Solve the following equations.

**(a)  $2(x + 4) = 12$**

**Solution:**

Let us divide both sides by 2.

$$= (2(x + 4))/2 = 12/2$$

$$= x + 4 = 6$$

By transposing 4 from LHS to RHS, it becomes -4

$$= x = 6 - 4$$

$$= x = 2$$

**(b)  $3(n - 5) = 21$**

**Solution:**

Let us divide both sides by 3.

$$= (3(n - 5))/3 = 21/3$$

$$= n - 5 = 7$$

By transposing -5 from LHS to RHS, it becomes 5

$$= n = 7 + 5$$

$$= n = 12$$

**(c)  $3(n - 5) = -21$**

**Solution:**

Let us divide both sides by 3.

$$= (3(n - 5))/3 = -21/3$$

$$= n - 5 = -7$$

By transposing -5 from LHS to RHS, it becomes 5

$$= n = -7 + 5$$

$$= n = -2$$

**(d)  $-4(2 + x) = 8$**

**Solution:**

Let us divide both sides by -4.

$$= (-4(2 + x))/(-4) = 8/(-4)$$

$$= 2 + x = -2$$

By transposing 2 from LHS to RHS, it becomes -2

$$= x = -2 - 2$$

$$= x = -4$$

**(e)  $4(2 - x) = 8$**

**Solution:**

Let us divide both sides by 4.

$$= (4(2 - x))/4 = 8/4$$

$$= 2 - x = 2$$

By transposing 2 from LHS to RHS, it becomes -2

$$= -x = 2 - 2$$

$$= -x = 0$$



$$= x = 0$$

**3. Solve the following equations.**

**(a)  $4 = 5(p - 2)$**

**Solution:**

Let us divide both sides by 5.

$$= 4/5 = (5(p - 2))/5$$

$$= 4/5 = p - 2$$

By transposing  $- 2$  from RHS to LHS, it becomes 2

$$= (4/5) + 2 = p$$

$$= (4 + 10)/ 5 = p$$

$$= p = 14/5$$

**(b)  $- 4 = 5(p - 2)$**

**Solution:**

Let us divide both sides by 5.

$$= - 4/5 = (5(p - 2))/5$$

$$= - 4/5 = p - 2$$

By transposing  $- 2$  from RHS to LHS, it becomes 2

$$= - (4/5) + 2 = p$$

$$= (- 4 + 10)/ 5 = p$$

$$= p = 6/5$$

**(c)  $16 = 4 + 3(t + 2)$**

**Solution:**

By transposing 4 from RHS to LHS, it becomes  $- 4$

$$= 16 - 4 = 3(t + 2)$$

$$= 12 = 3(t + 2)$$

Let us divide both sides by 3.

$$= 12/3 = (3(t + 2))/3$$

$$= 4 = t + 2$$

By transposing 2 from RHS to LHS, it becomes  $-2$

$$= 4 - 2 = t$$

$$= t = 2$$

**(d)  $4 + 5(p - 1) = 34$**

**Solution:**

By transposing 4 from LHS to RHS, it becomes  $-4$

$$= 5(p - 1) = 34 - 4$$

$$= 5(p - 1) = 30$$

Let us divide both sides by 5.

$$= (5(p - 1))/5 = 30/5$$

$$= p - 1 = 6$$

By transposing  $-1$  from RHS to LHS, it becomes 1

$$= p = 6 + 1$$

$$= p = 7$$

**(e)  $0 = 16 + 4(m - 6)$**

**Solution:**

By transposing 16 from RHS to LHS, it becomes  $-16$

$$= 0 - 16 = 4(m - 6)$$

$$= -16 = 4(m - 6)$$

Let us divide both sides by 4.

$$= -16/4 = (4(m - 6))/4$$

$$= -4 = m - 6$$

By transposing  $-6$  from RHS to LHS, it becomes 6

$$= -4 + 6 = m$$

$$= m = 2$$

**4. (a) Construct 3 equations starting with  $x = 2$** **Solution:**

The first equation is,

Multiply both sides by 6.

$$= 6x = 12 \dots \text{[equation 1]}$$

The second equation is,

Subtracting 4 from both sides,

$$= 6x - 4 = 12 - 4$$

$$= 6x - 4 = 8 \dots \text{[equation 2]}$$

The third equation is,

Divide both sides by 6.

$$= (6x/6) - (4/6) = (8/6)$$

$$= x - (4/6) = (8/6) \dots \text{[equation 3]}$$

**(b) Construct 3 equations starting with  $x = -2$** **Solution:**

The first equation is,

Multiply both sides by 5.

$$= 5x = -10 \dots \text{[equation 1]}$$

The second equation is,

Subtracting 3 from both sides,

$$= 5x - 3 = -10 - 3$$

$$= 5x - 3 = -13 \dots \text{[equation 2]}$$

The third equation is,

Dividing both sides by 2.

$$= (5x/2) - (3/2) = (-13/2) \dots \text{[equation 3]}$$

## EXERCISE 4.4

PAGE: 91

1. Set up equations and solve them to find the unknown numbers in the following cases.

(a) Add 4 to eight times a number; you get 60.

**Solution:**

Let us assume the required number is  $x$ .

Eight times a number =  $8x$

The given above statement can be written in the equation form as,

$$= 8x + 4 = 60$$

By transposing 4 from LHS to RHS, it becomes  $- 4$

$$= 8x = 60 - 4$$

$$= 8x = 56$$

Divide both sides by 8.

Then, we get

$$= (8x/8) = 56/8$$

$$= x = 7$$

(b) One-fifth of a number minus 4 gives 3.

**Solution:**

Let us assume the required number is  $x$ .

One-fifth of a number =  $(1/5) x = x/5$

The given above statement can be written in the equation form as,

$$= (x/5) - 4 = 3$$

By transposing  $- 4$  from LHS to RHS, it becomes 4

$$= x/5 = 3 + 4$$

$$= x/5 = 7$$

Multiply both sides by 5.

Then, we get

$$= (x/5) \times 5 = 7 \times 5$$

$$= x = 35$$

**(c) If I take three-fourths of a number and add 3 to it, I get 21.**

**Solution:**

Let us assume the required number is x.

Three-fourths of a number =  $(3/4) x$

The given above statement can be written in the equation form as,

$$= (3/4) x + 3 = 21$$

By transposing 3 from LHS to RHS, it becomes  $- 3$

$$= (3/4) x = 21 - 3$$

$$= (3/4) x = 18$$

Multiply both sides by 4.

Then, we get

$$= (3x/4) \times 4 = 18 \times 4$$

$$= 3x = 72$$

Then,

Divide both sides by 3.

$$= (3x/3) = 72/3$$

$$= x = 24$$

**(d) When I subtracted 11 from twice a number, the result was 15.**

**Solution:**

Let us assume the required number is x.

Twice a number =  $2x$

The given above statement can be written in the equation form as,

$$= 2x - 11 = 15$$

By transposing -11 from LHS to RHS, it becomes 11

$$= 2x = 15 + 11$$

$$= 2x = 26$$

Then,

Divide both sides by 2.

$$= (2x/2) = 26/2$$

$$= x = 13$$

**(e) Munna subtracts thrice the number of notebooks he has from 50, and he finds the result to be 8.**

**Solution:**

Let us assume the required number is x.

Thrice the number =  $3x$

The given above statement can be written in the equation form as,

$$= 50 - 3x = 8$$

By transposing 50 from LHS to RHS, it becomes  $- 50$

$$= - 3x = 8 - 50$$

$$= -3x = - 42$$

Then,

Divide both sides by -3.

$$= (-3x/-3) = - 42/-3$$

$$= x = 14$$

**(f) Ibenhal thinks of a number. If she adds 19 to it and divides the sum by 5, she will get 8.**

**Solution:**

Let us assume the required number is x.

The given above statement can be written in the equation form as,

$$= (x + 19)/5 = 8$$

Multiply both sides by 5.

$$= ((x + 19)/5) \times 5 = 8 \times 5$$

$$= x + 19 = 40$$

Then,

By transposing 19 from LHS to RHS, it becomes  $- 19$

$$= x = 40 - 19$$

$$= x = 21$$

**(g) Anwar thinks of a number. If he takes away 7 from  $5/2$  of the number, the result is 23.**

**Solution:**

Let us assume the required number is  $x$

$$5/2 \text{ of the number} = (5/2) x$$

The given above statement can be written in the equation form as,

$$= (5/2) x - 7 = 23$$

By transposing  $-7$  from LHS to RHS, it becomes 7

$$= (5/2) x = 23 + 7$$

$$= (5/2) x = 30$$

Multiply both sides by 2,

$$= ((5/2) x) \times 2 = 30 \times 2$$

$$= 5x = 60$$

Then,

Divide both sides by 5.

$$= 5x/5 = 60/5$$

$$= x = 12$$

**2. Solve the following.**

(a) The teacher tells the class that the highest marks obtained by a student in her class are twice the lowest marks plus 7. The highest score is 87. What is the lowest score?

**Solution:**

Let us assume the lowest score is  $x$ .

From the question, it is given that

The highest score is = 87

The highest marks obtained by a student in her class are twice the lowest marks plus 7 =  $2x + 7$

$\frac{5}{2}$  of the number =  $(\frac{5}{2})x$

The given above statement can be written in the equation form as,

Then,

$$= 2x + 7 = \text{Highest score}$$

$$= 2x + 7 = 87$$

By transposing 7 from LHS to RHS, it becomes -7

$$= 2x = 87 - 7$$

$$= 2x = 80$$

Now,

Divide both sides by 2.

$$= \frac{2x}{2} = \frac{80}{2}$$

$$= x = 40$$

Hence, the lowest score is 40.

(b) In an isosceles triangle, the base angles are equal. The vertex angle is  $40^\circ$ .

What are the base angles of the triangle? (Remember, the sum of three angles of a triangle is  $180^\circ$ .)

**Solution:**

From the question, it is given that

We know that the sum of angles of a triangle is  $180^\circ$

Let the base angle be  $b$ .



Then,

$$= b + b + 40^\circ = 180^\circ$$

$$= 2b + 40 = 180^\circ$$

By transposing 40 from LHS to RHS, it becomes -40

$$= 2b = 180 - 40$$

$$= 2b = 140$$

Now,

Divide both sides by 2.

$$= 2b/2 = 140/2$$

$$= b = 70^\circ$$

Hence,  $70^\circ$  is the base angle of an isosceles triangle.

**(c) Sachin scored twice as many runs as Rahul. Together, their runs fell two short of a double century. How many runs did each one score?**

**Solution:**

Let us assume Rahul's score is  $x$ .

Then,

Sachin scored twice as many runs as Rahul is  $2x$ .

Together, their runs fell two short of a double century.

$$= \text{Rahul's score} + \text{Sachin's score} = 200 - 2$$

$$= x + 2x = 198$$

$$= 3x = 198$$

Divide both sides by 3.

$$= 3x/3 = 198/3$$

$$= x = 66$$

So, Rahul's score is 66.

And Sachin's score is  $2x = 2 \times 66 = 132$

3. Solve the following:

(i) Irfan says that he has 7 marbles, more than five times the marbles Parmit has.

**Irfan has 37 marbles. How many marbles does Parmit have?**

**Solution:**

Let us assume the number of Parmit's marbles =  $m$

From the question, it is given that

Then,

Irfan has 7 marbles, more than five times the marbles Parmit has.

$= 5 \times \text{Number of Parmit's marbles} + 7 = \text{Total number of marbles Irfan having}$

$$= (5 \times m) + 7 = 37$$

$$= 5m + 7 = 37$$

By transposing 7 from LHS to RHS, it becomes -7

$$= 5m = 37 - 7$$

$$= 5m = 30$$

Divide both sides by 5.

$$= 5m/5 = 30/5$$

$$= m = 6$$

So, Parmit has 6 marbles.

(ii) Laxmi's father is 49 years old. He is 4 years older than three times Laxmi's age.

**What is Laxmi's age?**

**Solution:**

Let Laxmi's age be =  $y$  years old

From the question, it is given that

Lakshmi's father is 4 years older than three times her age.

$= 3 \times \text{Laxmi's age} + 4 = \text{Age of Lakshmi's father}$

$$= (3 \times y) + 4 = 49$$

$$= 3y + 4 = 49$$

By transposing 4 from LHS to RHS, it becomes -4

$$= 3y = 49 - 4$$

$$= 3y = 45$$

Divide both sides by 3.

$$= 3y/3 = 45/3$$

$$= y = 15$$

So, Lakshmi's age is 15 years.

**(iii) People of Sundargram planted trees in the village garden. Some of the trees were fruit trees. The number of non-fruit trees was two more than three times the number of fruit trees. What was the number of fruit trees planted if the number of non-fruit trees planted was 77?**

**Solution:**

Let the number of fruit trees be  $f$ .

From the question, it is given that

$$3 \times \text{number of fruit trees} + 2 = \text{number of non-fruit trees}$$

$$= 3f + 2 = 77$$

By transposing 2 from LHS to RHS, it becomes -2

$$= 3f = 77 - 2$$

$$= 3f = 75$$

Divide both sides by 3.

$$= 3f/3 = 75/3$$

$$= f = 25$$

So, the number of fruit trees was 25.

**4. Solve the following riddle.**

**I am a number,**

**Tell my identity!**

**Take me seven times over**

**And add a fifty!**

**To reach a triple century**

**You still need forty!**

**Solution:**

Let us assume the number is  $x$ .

Take me seven times over and add a fifty =  $7x + 50$

To reach a triple century you still need forty =  $(7x + 50) + 40 = 300$

$$= 7x + 50 + 40 = 300$$

$$= 7x + 90 = 300$$

By transposing 90 from LHS to RHS, it becomes -90

$$= 7x = 300 - 90$$

$$= 7x = 210$$

Divide both sides by 7.

$$= 7x/7 = 210/7$$

$$= x = 30$$

Hence, the number is 30.

