

## EXERCISE 4.1

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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:**

$$(i) x + 3 = 0$$

$$\text{LHS} = x + 3$$

By substituting the value of  $x = 3$

Then,

$$\text{LHS} = 3 + 3 = 6$$

By comparing LHS and RHS,

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

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

$$(ii) x + 3 = 0$$

$$\text{LHS} = x + 3$$

By substituting the value of  $x = 0$ ,

Then,

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

By comparing LHS and RHS,

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

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

$$(iii) x + 3 = 0$$

$$\text{LHS} = x + 3$$

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

Then,

$$\text{LHS} = -3 + 3 = 0$$

By comparing LHS and RHS,

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

$\therefore$  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,

$$1 \neq 4$$

LHS  $\neq$  RHS

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

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,

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

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

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