

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)	$(m/3) = 2$	$m = 6$	

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

∴ No, the equation is not satisfied.

(ii) $x + 3 = 0$

LHS = $x + 3$

By substituting the value of $x = 0$

Then,

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

By comparing LHS and RHS

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

∴ No, the equation is not satisfied.

$$\text{(iii) } x + 3 = 0$$

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

By substituting the value of $x = -3$

Then,

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

By comparing LHS and RHS

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

∴ Yes, the equation is satisfied

$$\text{(iv) } x - 7 = 1$$

$$\text{LHS} = x - 7$$

By substituting the value of $x = 7$

Then,

$$\text{LHS} = 7 - 7 = 0$$

By comparing LHS and RHS

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

∴ No, the equation is not satisfied

$$\text{(v) } x - 7 = 1$$

$$\text{LHS} = x - 7$$

By substituting the value of $x = 8$

Then,

$$\text{LHS} = 8 - 7 = 1$$

By comparing LHS and RHS

$\text{LHS} = \text{RHS}$ ∴ Yes, the equation is satisfied.

$$\text{(vi) } 5x = 25$$

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

By substituting the value of $x = 0$

Then,

$$\text{LHS} = 5 \times 0 = 0$$

By comparing LHS and RHS

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

∴ No, the equation is not satisfied.

$$\text{(vii) } 5x = 25$$

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

By substituting the value of $x = 5$

Then,

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

By comparing LHS and RHS

$\text{LHS} = \text{RHS}$ ∴ Yes, the equation is satisfied.

$$\text{(viii) } 5x = 25$$

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

By substituting the value of $x = -5$

Then,

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

By comparing LHS and RHS

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

∴ No, the equation is not satisfied.

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

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

By substituting the value of $m = -6$

Then,

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

By comparing LHS and RHS

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

∴ No, the equation is not satisfied.

$$(x) \quad m/3 = 2$$

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

By substituting the value of $m = 0$

Then,

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

By comparing LHS and RHS

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

∴ No, the equation is not satisfied.

$$(xi) \quad m/3 = 2$$

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

By substituting the value of $m = 6$

Then,

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

By comparing LHS and RHS

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

∴ 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:- 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,

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

$$= (7 \times (-2)) + 5$$

$$= -14 + 5$$

$$= -9$$

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:- 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 $7n + 5 = 19$.

$$\text{(d) } 4p - 3 = 13 \text{ (} p = 1 \text{)}$$

Solution:- LHS

$$= 4p - 3$$

By substituting the value of $p = 1$

Then,

$$\begin{aligned}\text{LHS} &= 4p - 3 \\ &= (4 \times 1) - 3 \\ &= 4 - 3 \\ &= 1\end{aligned}$$

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 $4p - 3 = 13$.

$$\text{(e) } 4p - 3 = 13 \text{ (} p = -4 \text{)}$$

Solution:- LHS

$$= 4p - 3$$

By substituting the value of $p = -4$

Then,

$$\begin{aligned}\text{LHS} &= 4p - 3 \\ &= (4 \times (-4)) - 3 \\ &= -16 - 3 \\ &= -19\end{aligned}$$

By comparing LHS and RHS

$$-19 \neq 13$$

LHS \neq 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:- LHS

$$= 4p - 3$$

By substituting the value of $p = 0$

Then,

$$\begin{aligned}\text{LHS} &= 4p - 3 \\ &= (4 \times 0) - 3 \\ &= 0 - 3 \\ &= -3\end{aligned}$$

By comparing LHS and RHS

$$-3 \neq 13$$

LHS \neq 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,

$$\begin{aligned}\text{LHS} &= 5p + 2 \\ &= (5 \times 0) + 2 \\ &= 0 + 2 \\ &= 2\end{aligned}$$

By comparing LHS and RHS

$$2 \neq 17$$

LHS \neq RHS

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

Let, $p = 1$

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

$$\begin{aligned} &= (5 \times 1) + 2 \\ &= 5 + 2 \\ &= 7 \end{aligned}$$

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, $p = 2$

$$\begin{aligned} \text{LHS} &= 5p + 2 \\ &= (5 \times 2) + 2 \\ &= 10 + 2 \\ &= 12 \end{aligned}$$

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, $p = 3$

$$\begin{aligned} \text{LHS} &= 5p + 2 \\ &= (5 \times 3) + 2 \\ &= 15 + 2 \\ &= 17 \end{aligned}$$

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:- 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, $m = 5$

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

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

$$= 15 - 14$$

$$= \text{By comparing LHS and RHS}$$

$$1 \neq$$

$\text{LHS} \neq \text{RHS}$ Hence, the value of $m = 5$ is not a solution to the given equation.

Let, $m =$

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

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

$$= 18 - 14$$

$$= 4$$

By comparing LHS and RHS

$$4 = 4$$

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

1

6

9

9

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-fourth 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 of 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 to be = y years old

Then,

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

$$\begin{aligned} &= 3 \times \text{Laxmi's age} + 4 = \text{Age of Lakshmi's father} \\ &= (3 \times y) + 4 = 49 \\ &= 3y + 4 = 49 \end{aligned}$$

(iii) The teacher tells the class that the highest marks obtained by a student in her class is 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 lowest score be l

$$\begin{aligned} &= 2 \times \text{Lowest score} + 7 = \text{Highest score in the class} \\ &= (2 \times l) + 7 = 87 \\ &= 2l + 7 = 87 \end{aligned}$$

(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°

Let base angle be b

Then,

Vertex angle = $2 \times$ base angle = $2b$

$$\begin{aligned} &= b + b + 2b = 180^\circ \\ &= 4b = 180^\circ \end{aligned}$$

EXERCISE 4.2

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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 the side of given equation,

Then we get,

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

$$= x = 1$$

(b) $x + 1 = 0$

Solution:-

We have to subtract 1 to both the side of given equation,

Then we get,

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

$$= x = -1$$

(c) $x - 1 = 5$

Solution:-

We have to add 1 to both the side of given equation,

Then we get,

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

$$= x = 6$$

(d) $x + 6 = 2$

Solution:-

We have to subtract 6 to both the side of given equation,

Then we get,

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

$$= x = -4$$

(e) $y - 4 = -7$

Solution:-

We have to add 4 to both the side of given equation,

Then we get,

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

$$= y = -3$$

(f) $y - 4 = 4$

Solution:-

We have to add 4 to both the side of given equation,

Then we get,

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

$$= y = 8$$

(g) $y + 4 = 4$

Solution:-

We have to subtract 4 to both the side of given equation,

Then we get,

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

$$= y = 0$$

(h) $y + 4 = -4$

Solution:-

We have to subtract 4 to both the side of 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,

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

$$= 1 = 14$$

(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,

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

$$= y = 9/4$$

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

Solution:-

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

Then we get,

$$\begin{aligned} &= (z/3) \times 3 = (5/4) \times 3 \\ &= x = 15/4 \end{aligned}$$

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

Solution:-

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

Then we get,

$$\begin{aligned} &= (a/5) \times 5 = (7/15) \times 5 \\ &= a = 7/3 \end{aligned}$$

(g) $20t = -10$

Solution:-

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

$$\begin{aligned} &= 20t/20 = -10/20 \\ &= x = -\frac{1}{2} \end{aligned}$$

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 the both sides of the equation,

Then, we get,

$$\begin{aligned} &= 3n - 2 + 2 = 46 + 2 \\ &= 3n = 48 \end{aligned}$$

Now,

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

Then, we get,

$$\begin{aligned} &= 3n/3 = 48/3 \\ &= n = 16 \end{aligned}$$

(b) $5m + 7 = 17$

Solution:-

First we have to subtract 7 to the 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 to the 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 to the 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 the 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 to the 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,

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

$$= q = -3$$

(l) $2q + 6 = 12$

Solution:-

First we have to subtract 6 to the 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

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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,

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

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

$$= 2y = 32/2 \text{ Now,}$$

Divide both side 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 side 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 side 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 side by 4,

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

$$= a = -8$$

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

Solution:-

First we have to multiply both the side by 2,

$$\begin{aligned} &= (5x/2) \times 2 = -5 \times 2 \\ &= 5x = -10 \end{aligned}$$

Now,

We have to divide both the side by 5,

Then we get,

$$\begin{aligned} &= 5x/5 = -10/5 \\ &= x = -2 \end{aligned}$$

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

Solution:-

First we have to multiply both the side by 2,

$$\begin{aligned} &= (5x/2) \times 2 = (25/4) \times 2 \\ &= 5x = (25/2) \end{aligned}$$

Now,

We have to divide both the side by 5,

Then we get,

$$\begin{aligned} &= 5x/5 = (25/2)/5 \\ &= x = (25/2) \times (1/5) \\ &= x = (5/2) \end{aligned}$$

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

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

Then,

$$\begin{aligned} &= 7m = 13 - (19/2) \\ &= 7m = (26 - 19)/2 \\ &= 7m = 7/2 \end{aligned}$$

Now, Divide both side by 7,

$$\begin{aligned} &= 7m/7 = (7/2)/7 \\ &= m = (7/2) \times (1/7) \end{aligned}$$

$$= m = \frac{1}{2}$$

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

Solution:-

By transposing 10 from LHS to RHS it becomes - 10

Then,

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

$$= 6z = -12 \text{ Now,}$$

Divide both side by 6,

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

$$= m = -2$$

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

Solution:-

First we have to multiply both the side by 2,

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

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

Now,

We have to divide both the side 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,

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

$$= 2b/3 = 8 \text{ Now,}$$

Multiply both side by 3,

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

$$= 2b = 24 \text{ And,}$$

Divide both side by 2,

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

$$= b = 12$$

2. Solve the following equations:

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

Solution:-

Let us divide both the side 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 the side 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 the side 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 the side 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 the side 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 the side 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 the side by 5,

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

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

By transposing - 2 from RHS to LHS it becomes 2

$$\begin{aligned} &= -(4/5) + 2 = p \\ &= (-4 + 10)/5 = p \\ &= p = 6/5 \end{aligned}$$

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

Solution:-By transposing 4 from RHS to LHS it becomes -4

$$\begin{aligned} &= 16 - 4 = 3(t + 2) \\ &= 12 = 3(t + 2) \end{aligned}$$

Let us divide both the side by 3,

$$\begin{aligned} &= 12/3 = (3(t + 2))/3 \\ &= 4 = t + 2 \end{aligned}$$

By transposing 2 from RHS to LHS it becomes -2

$$\begin{aligned} &= 4 - 2 = t \\ &= t = 2 \end{aligned}$$

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

Solution:-By transposing 4 from LHS to RHS it becomes -4

$$\begin{aligned} &= 5(p - 1) = 34 - 4 \\ &= 5(p - 1) = 30 \end{aligned}$$

Let us divide both the side by 5,

$$\begin{aligned} &= (5(p - 1))/5 = 30/5 \\ &= p - 1 = 6 \end{aligned}$$

By transposing -1 from RHS to LHS it becomes 1

$$\begin{aligned} &= p = 6 + 1 \\ &= p = 7 \end{aligned}$$

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

Solution:-By transposing 16 from RHS to LHS it becomes -16

$$\begin{aligned} &= 0 - 16 = 4(m - 6) \\ &= -16 = 4(m - 6) \end{aligned}$$

Let us divide both the side 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:- First

equation is,

Multiply both side by 6

$$= 6x = 12$$

... [equation 1]

Second equation is,

Subtracting 4 from both side,

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

$$= 6x - 4 = 8$$

... [equation 2]

Third equation is,

Divide both side by 6

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

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

... [equation 3]

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

Solution:- First

equation is,

Multiply both side by 5

$$= 5x = -10$$

... [equation 1]

Second equation is,

Subtracting 3 from both side,

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

$$= 5x - 3 = -13$$

... [equation 2]

Third equation is,

Dividing both sides by 2

$$= (5x/2) - (3/2) = (-13/2)$$

... [equation 3]

EXERCISE 4.4

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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 be 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 side 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 be 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 side 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 be 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 side by 4,

Then we get,

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

$$= 3x = 72$$

Then,

Divide both side 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 be 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 side by 2,

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

$$= x = 13$$

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

Solution:-

Let us assume the required number be 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 side 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 be x

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

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

Multiply both side 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 be x

$5/2$ 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 side by 2,

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

$$= 5x = 60$$

Then,

Divide both the side 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 is twice the lowest marks plus 7. The highest score is 87. What is the lowest score?

Solution:-

Let us assume the lowest score be x

From the question it is given that,

The highest score is = 87

Highest marks obtained by a student in her class is twice the lowest marks plus 7 = $2x + 7$

5/2 of the number = $(5/2)x$

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 the side by 2

$$= 2x/2 = 80/2$$

$$= x = 40$$

Hence, the lowest score is 40

(b) In an isosceles triangle, the base angles are equal. The vertex angle is 40° . What are the base angles of the triangle? (Remember, the sum of three angles of a triangle is 180°).

Solution:-

From the question it is given that,

We know that, the sum of angles of a triangle is 180°

Let 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 the side by 2

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

$$= b = 70^\circ$$

Hence, 70° 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 be 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 the side 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 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 the side 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 to be = y years old

From the question it is given that,

Lakshmi's father is 4 years older than three times of 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 the side 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 were 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 the side by 3

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

$$= f = 25$$

So, number of fruit tree 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 be 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 side by 7

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

$$= x = 30$$

Hence the number is 30.