

Board – CBSE

Class – 7th

Topic – Simple Equations 4.1

Q.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)	$\frac{m}{3} = 2$	$m = -6$	-
(x)	$\frac{m}{3} = 2$	$m = 0$	-
(xi)	$\frac{m}{3} = 2$	$m = 6$	-

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

$$\text{L.H.S.} = x + 3$$

By putting $x = 3$,

$$\text{L.H.S.} = 3 + 3 = 6 \neq \text{R.H.S.}$$

\therefore No, the equation is not satisfied.

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

$$\text{L.H.S.} = x + 3$$

By putting $x = 0$,

$$\text{L.H.S.} = 0 + 3 = 3 \neq \text{R.H.S.}$$

\therefore No, the equation is not satisfied.

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

$$\text{L.H.S.} = x + 3$$

By putting $x = -3$,

$$\text{L.H.S.} = -3 + 3 = 0 = \text{R.H.S.}$$

\therefore Yes, the equation is satisfied.

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

$$\text{L.H.S.} = x - 7$$

By putting $x = 7$,

$$\text{L.H.S.} = 7 - 7 = 0 \neq \text{R.H.S.}$$

\therefore No, the equation is not satisfied.

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

$$\text{L.H.S.} = x - 7$$

By putting $x = 8$,

$$\text{L.H.S.} = 8 - 7 = 1 = \text{R.H.S.}$$

\therefore Yes, the equation is satisfied.

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

$$\text{L.H.S.} = 5x$$

By putting $x = 0$,

$$\text{L.H.S.} = 5 \times 0 = 0 \neq \text{R.H.S.}$$

∴ No, the equation is not satisfied.

$$(vii) 5x = 25$$

$$\text{L.H.S.} = 5x$$

By putting $x = 5$,

$$\text{L.H.S.} = 5 \times 5 = 25 = \text{R.H.S.}$$

∴ Yes, the equation is satisfied.

$$(viii) 5x = 25$$

$$\text{L.H.S.} = 5x$$

By putting $x = -5$,

$$\text{L.H.S.} = 5 \times (-5) = -25 \neq \text{R.H.S.}$$

∴ No, the equation is not satisfied.

$$(ix) \frac{m}{3} = 2$$

$$\text{L.H.S.} = \frac{m}{3}$$

By putting $m = -6$

$$\text{L. H. S.} = \frac{-6}{3} = -2, \neq \text{R.H.S.}$$

∴ No, the equation is not satisfied.

$$(x) \frac{m}{3} = 2$$

$$\text{L.H.S.} = \frac{m}{3}$$

By putting $m = 0$,

$$\text{L.H.S.} = 0/3 = 0 \neq \text{R.H.S.}$$

∴ No, the equation is not satisfied.

$$(xi) \frac{m}{3} = 2$$

$$\text{L.H.S.} = \frac{m}{3}$$

By putting $m = 6$,

$$\text{L.H.S.} = \frac{6}{3} = 2 = \text{R.H.S.}$$

∴ Yes, the equation is satisfied.

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

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

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

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

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

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

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

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

Putting $n = 1$ in L.H.S.,

$$n + 5 = 1 + 5 = 6 \neq 19$$

As L.H.S. \neq R.H.S.,

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

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

Putting $n = -2$ in L.H.S.,

$$7n + 5 = 7 \times (-2) + 5 = -14 + 5 = -9 \neq 19$$

As L.H.S. \neq R.H.S.,

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

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

Putting $n = 2$ in L.H.S.,

$$7n + 5 = 7 \times (2) + 5 = 14 + 5 = 19 = \text{R.H.S.}$$

As L.H.S. = R.H.S.,

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

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

Putting $p = 1$ in L.H.S.,

$$4p - 3 = (4 \times 1) - 3 = 1 \neq 13$$

As L.H.S. \neq R.H.S.,

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

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

Putting $p = -4$ in L.H.S.,

$$4p - 3 = 4 \times (-4) - 3 = -16 - 3 = -19 \neq 13$$

As L.H.S. \neq R.H.S.,

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

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

Putting $p = 0$ in L.H.S.,

$$4p - 3 = (4 \times 0) - 3 = -3 \neq 13$$

As L.H.S. \neq R.H.S.,

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

Q.3 Solve the following equations by trial and error method:

(i) $5p + 2 = 17$ (ii) $3m - 14 = 4$

Sol: (i) $5p + 2 = 17$

Putting $p = 1$ in L.H.S.,

$$(5 \times 1) + 2 = 7 \neq \text{R.H.S.}$$

Putting $p = 2$ in L.H.S.,

$$(5 \times 2) + 2 = 10 + 2 = 12 \neq \text{R.H.S.}$$

Putting $p = 3$ in L.H.S.,

$$(5 \times 3) + 2 = 17 = \text{R.H.S.}$$

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

(ii) $3m - 14 = 4$

Putting $m = 4$,

$$(3 \times 4) - 14 = -2 \neq \text{R.H.S.}$$

Putting $m = 5$,

$$(3 \times 5) - 14 = 1 \neq \text{R.H.S.}$$

Putting $m = 6$,

$$(3 \times 6) - 14 = 18 - 14 = 4 = \text{R.H.S.}$$

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

Q.4 Write equations for the following statements:

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

(ii) 2 subtracted from y is 8.

- (iii) Ten times a is 70.
- (iv) The number b divided by 5 gives 6.
- (v) Three-fourth of t is 15.
- (vi) Seven times m plus 7 gets you 77.
- (vii) One-fourth of a number x minus 4 gives 4.
- (viii) If you take away 6 from 6 times y, you get 60.
- (ix) If you add 3 to one-third of z, you get 30.

Sol: (i) $x + 4 = 9$

(ii) $y - 2 = 8$

(iii) $10a = 70$

(iv) $\frac{b}{5} = 6$

(v) $\frac{3}{4}t = 15$

(vi) Seven times of m is 7m.

$$7m + 7 = 77$$

(vii) One-fourth of a number x is $\frac{x}{4}$.

(viii) Six times of y is 6y.

$$6y - 6 = 60$$

(ix) One-third of z is $\frac{z}{3}$.

$$\frac{z}{3} + 3 = 30$$

Q.5 Write the following equations in statement forms:

(i) $p + 4 = 15$

(ii) $m - 7 = 3$

(iii) $2m = 7$

(iv) $\frac{m}{5} = 3$

(v) $\frac{3m}{5} = 6$

(vi) $3p + 4 = 25$

(vii) $4p - 2 = 18$

(viii) $\frac{p}{2} + 2 = 8$

Sol: (i) The sum of p and 4 is 15.

(ii) 7 subtracted from m is 3.

(iii) Twice of a number m is 7.

(iv) One-fifth of m is 3.

- (v) Three-fifth of m is 6.
- (vi) Three times of a number p , when added to 4, gives 25.
- (vii) When 2 is subtracted from four times of a number p , it gives 18.
- (viii) When 2 is added to half of a number p , it gives 8.

Q.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.)
- (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.)
- (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 .)
- (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.)

Sol: (i) Let Parmit has m marbles.

$$5 \times \text{Number of marbles with Parmit} + 7 = \text{Number of marbles with Irfan}$$

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

$$5m + 7 = 37$$

(ii) Let Laxmi be y years old.

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

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

$$3y + 4 = 49$$

(iii) Let the lowest marks be l .

$$2 \times \text{Lowest marks} + 7 = \text{Highest marks}$$

$$2 \times l + 7 = 87$$

$$2l + 7 = 87$$

(iv) An isosceles triangle has two of its angles of equal measure.

Let the base angle be b .

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

$$\text{Sum of all interior angles of a } \Delta = 180^\circ$$

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

$$4b = 180^\circ$$