

## **Ques:- What is equation?**

An equation is a condition on a variable such that two expressions in the variable should have equal value.

The value of the variable for which the equation is satisfied is called **the solution of the equation.**

**For ex.**  $n+7=9$ . ( $n=2$ )

If we put  $n=2$  in given equation, we get

$$2+7=9$$

$$9=9$$

## Exercise 4.1

### Question 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)	$5x=25$	$x=-5$	
(viii)	$\frac{m}{3}=2$	$m=-6$	
(ix)	$\frac{m}{3}=2$	$m=0$	
(x)	$\frac{m}{3}=2$	$m=6$	

### Answer 1:

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
(viii)	$\frac{m}{3}=2$	$m=-6$	No
(ix)	$\frac{m}{3}=2$	$m=0$	No
(x)	$\frac{m}{3}=2$	$m=6$	Yes

### Question 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)  $4p-3=13(p=0)$

## Answer 2:

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

Putting  $n = 1$  in L.H.S.,  $1 + 5 = 6$

$\therefore$  L.H.S.  $\neq$  R.H.S.,

$\therefore n = 1$  is not the solution of given equation.

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

Putting  $n = -2$  in L.H.S.,  $7(-2) + 5 = -14 + 5 = -9$

$\therefore$  L.H.S.  $\neq$  R.H.S.,

$\therefore n = -2$  is not the solution of given equation.

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

Putting  $n = 2$  in L.H.S.,  $7(2) + 5 = 14 + 5 = 19$

$\therefore$  L.H.S. = R.H.S.,

$\therefore n = 2$  is the solution of given equation.

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

Putting  $p = 1$  in L.H.S.,  $4(1) - 3 = 4 - 3 = 1$

$\therefore$  L.H.S.  $\neq$  R.H.S.,

$\therefore p = 1$  is not the solution of given equation.

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

Putting  $p = -4$  in L.H.S.,  $4(-4) - 3 = -16 - 3 = -19$

$\therefore$  L.H.S.  $\neq$  R.H.S.,

$\therefore p = -4$  is not the solution of given equation.

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

Putting  $p = 0$  in L.H.S.,  $4(0) - 3 = 0 - 3 = -3$

$\therefore$  L.H.S.  $\neq$  R.H.S.,

$\therefore p = 0$  is not the solution of given equation.

## **Question 3:**

Solve the following equations by trial and error method:

(i)  $5p + 2 = 17$

(ii)  $3m - 14 = 4$

## Answer 3:

(i)  $5p + 2 = 17$

Putting  $p = -3$  in L.H.S.  $5(-3) + 2 = -15 + 2 = -13$

$\therefore -13 \neq 17$  Therefore,  $p = -3$  is not the solution.

Putting  $p = -2$  in L.H.S.  $5(-2) + 2 = -10 + 2 = -8$

$\therefore -8 \neq 17$  Therefore,  $p = -2$  is not the solution.

Putting  $p = -1$  in L.H.S.  $5(-1) + 2 = -5 + 2 = -3$

$\therefore -3 \neq 17$  Therefore,  $p = -1$  is not the solution.

Putting  $p = 0$  in L.H.S.  $5(0) + 2 = 0 + 2 = 2$

$\therefore 2 \neq 17$  Therefore,  $p = 0$  is not the solution.

Putting  $p = 1$  in L.H.S.  $5(1) + 2 = 5 + 2 = 7$

$\therefore 7 \neq 17$  Therefore,  $p = 1$  is not the solution.

Putting  $p = 2$  in L.H.S.  $5(2) + 2 = 10 + 2 = 12$

$\therefore 12 \neq 17$  Therefore,  $p = 2$  is not the solution.

Putting  $p = 3$  in L.H.S.  $5(3) + 2 = 15 + 2 = 17$

$\therefore 17 = 17$  Therefore,  $p = 3$  is the solution.

(ii)  $3m - 14 = 4$

Putting  $m = -2$  in L.H.S.  $3(-2) - 14 = -6 - 14 = -20$

$\therefore -20 \neq 4$  Therefore,  $m = -2$  is not the solution.

Putting  $m = -1$  in L.H.S.  $3(-1) - 14 = -3 - 14 = -17$

$\therefore -17 \neq 4$  Therefore,  $m = -1$  is not the solution.

Putting  $m = 0$  in L.H.S.  $3(0) - 14 = 0 - 14 = -14$

$\therefore -14 \neq 4$  Therefore,  $m = 0$  is not the solution.

Putting  $m = 1$  in L.H.S.  $3(1) - 14 = 3 - 14 = -11$

$\therefore -11 \neq 4$  Therefore,  $m = 1$  is not the solution.

Putting  $m = 2$  in L.H.S.  $3(2) - 14 = 6 - 14 = -8$

$\therefore -8 \neq 4$  Therefore,  $m = 2$  is not the solution.

Putting  $m = 3$  in L.H.S.  $3(3) - 14 = 9 - 14 = -5$

$\therefore -5 \neq 4$  Therefore,  $m = 3$  is not the solution.

Putting  $m = 4$  in L.H.S.  $3(4) - 14 = 12 - 14 = -2$

$\therefore -2 \neq 4$  Therefore,  $m = 4$  is not the solution.

Putting  $m = 5$  in L.H.S.  $3(5) - 14 = 15 - 14 = 1$

$\therefore 1 \neq 4$  Therefore,  $m = 5$  is not the solution.

Putting  $m = 6$  in L.H.S.  $3(6) - 14 = 18 - 14 = 4$

$\therefore 4 = 4$  Therefore,  $m = 6$  is the solution.

#### Question 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.

#### Answer 4:

(i)  $x + 4 = 9$  (ii)  $y - 2 = 8$  (iii)  $10a = 70$  (iv)  $\frac{b}{5} = 6$  (v)  $\frac{3}{4}t = 15$

(vi)  $7m + 7 = 77$  (vii)  $\frac{x}{4} - 4 = 4$  (viii)  $6y - 6 = 60$  (ix)  $\frac{z}{3} + 3 = 30$

### Question 5:

Write the following equations in statement form:

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

### Answer 5:

- (i) The sum of numbers  $p$  and 4 is 15.
- (ii) 7 subtracted from  $m$  is 3.
- (iii) Two times  $m$  is 7.
- (iv) The number  $m$  is divided by 5 gives 3.
- (v) Three-fifth of the number  $m$  is 6.
- (vi) Three times  $p$  plus 4 gets 25.
- (vii) If you take away 2 from 4 times  $p$ , you get 18.
- (viii) If you added 2 to half is  $p$ , you get 8.

### Question 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 are 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  $180^\circ$ .)

### Answer 6:

- (i) Let  $m$  be the number of Parmit's marbles.  
 $\therefore 5m + 7 = 37$
- (ii) Let the age of Laxmi be  $y$  years.  
 $\therefore 3y + 4 = 49$
- (iii) Let the lowest score be  $l$ .  
 $\therefore 2l + 7 = 87$
- (iv) Let the base angle of the isosceles triangle be  $b$ , so vertex angle =  $2b$ .  
 $\therefore 2b + b + b = 180^\circ$   
 $\Rightarrow 4b = 180^\circ$  [Angle sum property of a  $\Delta$ ]