Mathematics

(Chapter – 11) (Algebra)
(Class – VI)

Exercise 11.5

Question 1:

State which of the following are equations (with a variable). Given reason for your answer. Identify the variable from the equations with a variable.

(a) $17 = x + 7$ (b) $(t - 7) > 5$ (c) $\dfrac{4}{2} = 2$ (d) $(7 \times 3) - 19 = 8$

(e) $5 \times 4 - 8 = 2x$ (f) $x - 2 = 0$ (g) $2m < 30$ (h) $2n + 1 = 11$

(i) $7 = (11 \times 5) - (12 \times 4)$ (j) $7 = (11 \times 2) + p$ (k) $20 = 5y$ (l) $\dfrac{3q}{2} < 5$

(m) $z + 12 > 24$ (n) $20 - (10 - 5) = 3 \times 5$ (o) $7 - x = 5$

Answer 1:

(a) It is an equation of variable as both the sides are equal. The variable is x.
(b) It is not an equation as L.H.S. is greater than R.H.S.
(c) It is an equation with no variable. But it is a false equation.
(d) It is an equation with no variable. But it is a false equation.
(e) It is an equation of variable as both the sides are equal. The variable is x.
(f)) It is an equation of variable x.
(g) It is not an equation as L.H.S. is less than R.H.S.
(h) It is an equation of variable as both the sides are equal. The variable is n.
(i) It is an equation with no variable as its both sides are equal.
(j) It is an equation of variable p.
(k) It is an equation of variable y.
(l) It is not an equation as L.H.S. is less than R.H.S.
(m) It is not an equation as L.H.S. is greater than R.H.S.
(n) It is an equation with no variable.
(o) It is an equation of variable x.

Question 2:

Complete the entries of the third column of the table:

S. No.	Equation	Value of variable	Equation satisfied Yes/No
(a)	$10y = 80$	$y = 10$	
(b)	$10y = 80$	$y = 8$	
(c)	$10y = 80$	$y = 5$	
(d)	$4l = 20$	$l = 20$	
(e)	$4l = 20$	$l = 80$	
(f)	$4l = 20$	$l = 5$	
(g)	$b + 5 = 9$	$b = 5$	
(h)	$b + 5 = 9$	$b = 9$	
(i)	$b + 5 = 9$	$b = 4$	
(j)	$h - 8 = 5$	$h = 13$	
(k)	$h - 8 = 5$	$h = 8$	
(l)	$h - 8 = 5$	$h = 0$	
(m)	$p + 3 = 1$	$p = 3$	
(n)	$p + 3 = 1$	$p = 1$	
(o)	$p + 3 = 1$	$p = 0$	
(p)	$p + 3 = 1$	$p = -1$	
(q)	$p + 3 = 1$	$p = -2$	

Answer 2:

S. No.	Equation	Value of variable	Equ. satisfied Yes / No	Sol. of L.H.S.
(a)	$10y = 80$	$y = 10$	No	10 x 10 = 100
(b)	$10y = 80$	$y = 8$	Yes	10 x 8 = 80
(c)	$10y = 80$	$y = 5$	No	10 x 5 = 50
(d)	$4l = 20$	$l = 20$	No	4 x 20 = 80
(e)	$4l = 20$	$l = 80$	No	4 x 80 = 320
(f)	$4l = 20$	$l = 5$	Yes	4 x 5 = 20
(g)	$b + 5 = 9$	$b = 5$	No	5 + 5 = 10
(h)	$b + 5 = 9$	$b = 9$	Yes	9 + 5 = 14
(i)	$b + 5 = 9$	$b = 4$	Yes	4 + 5 = 9
(j)	$h - 8 = 5$	$h = 13$	Yes	13 – 8 = 5
(k)	$h - 8 = 5$	$h = 8$	No	8 – 8 = 0
(l)	$h - 8 = 5$	$h = 0$	No	0 – 8 = –8
(m)	$p + 3 = 1$	$p = 3$	No	3 + 3 = 6
(n)	$p + 3 = 1$	$p = 1$	No	1 + 3 = 4
(o)	$p + 3 = 1$	$p = 0$	No	0 + 3 = 3
(p)	$p + 3 = 1$	$p = -1$	No	–1 + 3 = 2
(q)	$p + 3 = 1$	$p = -2$	Yes	–2 + 3 = 1

Question 3:

Pick out the solution from the values given in the bracket next to each equation. Show that the other values do not satisfy the equation.

(a) $5m = 60$ (10, 5, 12, 15)   (b) $n + 12 = 20$ (12, 8, 20, 0)

(c) $p - 5 = 5$ (0, 10, 5, –5)   (d) $\dfrac{q}{2} = 7$ (7, 2, 10, 14)

(e) $r - 4 = 0$ (4, –4, 8, 0)   (f) $x + 4 = 2$ (–2, 0, 2, 4)

Answer 3:

(a) $5m = 60$
Putting the given values in L.H.S.,

5 x 10 = 50   5 x 5 = 25
∵ L.H.S. ≠ R.H.S.   ∵ L.H.S. ≠ R.H.S.
∴ $m = 10$ is not the solution.   ∴ $m = 5$ is not the solution.
5 x 12 = 60   5 x 15 = 75
∵ L.H.S. = R.H.S.   ∵ L.H.S. ≠ R.H.S.
∴ $m = 12$ is a solution.   ∴ $m = 15$ is not the solution.

(b) $n + 12 = 20$
Putting the given values in L.H.S.,

12 + 12 = 24   8 + 12 = 20
∵ L.H.S. ≠ R.H.S.   ∵ L.H.S. = R.H.S.
∴ $n = 12$ is not the solution.   ∴ $n = 8$ is a solution.
20 + 12 = 32   0 + 12 = 12
∵ L.H.S. ≠ R.H.S.   ∵ L.H.S. ≠ R.H.S.
∴ $n = 20$ is not the solution.   ∴ $n = 0$ is not the solution.

(c) $p - 5 = 5$

Putting the given values in L.H.S.,

$0 - 5 = -5$

∵ L.H.S. ≠ R.H.S.

∴ $p = 0$ is not the solution.

$5 - 5 = 0$

∵ L.H.S. ≠ R.H.S.

∴ $p = 5$ is not the solution.

$10 - 5 = 5$

∵ L.H.S. = R.H.S.

∴ $p = 10$ is a solution.

$-5 - 5 = -10$

∵ L.H.S. ≠ R.H.S.

∴ $p = -5$ is not the solution.

(d) $\dfrac{q}{2} = 7$

Putting the given values in L.H.S.,

$\dfrac{7}{2}$

∵ L.H.S. ≠ R.H.S.

∴ $q = 7$ is not the solution.

$\dfrac{10}{2} = 5$

∵ L.H.S. ≠ R.H.S.

∴ $q = 10$ is not the solution.

$\dfrac{2}{2} = 1$

∵ L.H.S. ≠ R.H.S.

∴ $q = 2$ is not the solution.

$\dfrac{14}{2} = 7$

∵ L.H.S. = R.H.S.

∴ $q = 14$ is a solution.

(e) $r - 4 = 0$

Putting the given values in L.H.S.,

$4 - 4 = 0$

∵ L.H.S. = R.H.S.

∴ $r = 4$ is a solution.

$8 - 4 = 4$

∵ L.H.S. ≠ R.H.S.

∴ $r = 8$ is not the solution.

$-4 - 4 = -8$

∵ L.H.S. ≠ R.H.S.

∴ $r = -4$ is not the solution.

$0 - 4 = -4$

∵ L.H.S. ≠ R.H.S.

∴ $r = 0$ is not the solution.

(f) $x + 4 = 2$

Putting the given values in L.H.S.,

$-2 + 4 = 2$

∵ L.H.S. = R.H.S.

∴ $x = -2$ is a solution.

$2 + 4 = 6$

∵ L.H.S. ≠ R.H.S.

∴ $x = 2$ is not the solution.

$0 + 4 = 4$

∵ L.H.S. ≠ R.H.S.

∴ $x = 0$ is not the solution.

$4 + 4 = 8$

∵ L.H.S. ≠ R.H.S.

∴ $x = 4$ is not the solution.

Question 4:

(a) Complete the table and by inspection of the table find the solution to the equation $m + 10 = 16$.

m	1	2	3	4	5	6	7	8	9	10	----	----	----
$m + 10$	----	----	----	----	----	----	----	----	----	----	----	----	----

(b) Complete the table and by inspection of the table find the solution to the equation $5t = 35$

t	3	4	5	6	7	8	9	10	11	----	----	----	----	----
$5t$	----	----	----	----	----	----	----	----	----	----	----	----	----

(c) Complete the table and by inspection of the table find the solution to the equation $\frac{z}{3} = 4$.

z	8	9	10	11	12	13	14	15	16	----	----	----	----
$\frac{z}{3}$	$2\frac{2}{3}$	3	$3\frac{1}{3}$	----	----	----	----	----	----	----	----	----	----

(d) Complete the table and by inspection of the table find the solution to the equation $m - 7 = 3$.

m	5	6	7	8	9	10	11	12	13	----	----
$m-7$	----	----	----	----	----	----	----	----	----	----	----

Answer 4:

(a)

m	1	2	3	4	5	6	7	8	9	10	11	12	13
$m+10$	11	12	13	14	15	16	17	18	19	20	21	22	23

∵ At $m = 6$, $m + 10 = 16$

∴ $m = 6$ is the solution.

(b)

t	3	4	5	6	7	8	9	10	11	12	13	14	15	16
$5t$	15	20	25	30	35	40	45	50	55	60	65	70	75	80

∵ At $t = 7$, $5t = 35$

∴ $t = 7$ is the solution.

(c)

z	8	9	10	11	12	13	14	15	16	17	18	19	20
$\frac{z}{3}$	$2\frac{2}{3}$	3	$3\frac{1}{3}$	$3\frac{2}{3}$	4	$4\frac{1}{3}$	$4\frac{2}{3}$	5	$5\frac{1}{3}$	$5\frac{2}{3}$	6	$6\frac{1}{3}$	$6\frac{2}{3}$

∵ At $z = 12$, $\frac{z}{3} = 4$

∴ $z = 12$ is the solution.

(d)

m	5	6	7	8	9	10	11	12	13	14	15
$m-7$	-2	-1	0	1	2	3	4	5	6	7	8

∵ At $m = 10$, $m - 7 = 3$

∴ $m = 10$ is the solution.