PUBLIC SCHOOL DARBHANGA

SESSION 2020-21

MATHEMATICS

CLASS : VII

SIMPLE EQUATIONS

(answer key)

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 ≠ RHS

∴ No, the equation is not satisfied.

(ii) x + 3 = 0

LHS = x + 3

By substituting the value of x = 0

Then,

LHS = 0 + 3 = 3

By comparing LHS and RHS

LHS ≠ RHS

∴ No, the equation is not satisfied.

(iii) $x + 3 = 0$
LHS = $x + 3$
By substituting the value of $x = -3$
Then,
LHS = $-3 + 3 = 0$
By comparing LHS and RHS
LHS = 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,
LHS = 5 × 5 = 25
By comparing LHS and RHS
LHS = RHS
∴ Yes, the equation is satisfied.

(viii) 5x = 25
LHS = 5x
By substituting the value of x = -5
Then,
LHS = 5 × (-5) = - 25
By comparing LHS and RHS
LHS ≠ RHS
∴ No, the equation is not satisfied.

(ix) m/3 = 2
LHS = m/3
By substituting the value of m = - 6
Then,
LHS = -6/3 = - 2
By comparing LHS and RHS
LHS ≠ RHS
∴ No, the equation is not satisfied.

(x) m/3 = 2
LHS = m/3
By substituting the value of m = 0
Then,
LHS = 0/3 = 0
By comparing LHS and RHS
LHS ≠ RHS
∴ No, the equation is not satisfied.

(xi) m/3 = 2
LHS = m/3

By substituting the value of m = 6
Then,
LHS = 6/3 = 2
By comparing LHS and RHS
LHS = 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,
LHS = n + 5
= 1 + 5
= 6
By comparing LHS and RHS
6 ≠ 19
LHS ≠ 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:-

LHS = 7n + 5
By substituting the value of n = -2
Then,
LHS = 7n + 5
= (7 × (-2)) + 5
= - 14 + 5
= - 9
By comparing LHS and RHS
-9 ≠ 19
LHS ≠ 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,
LHS = 7n + 5
= (7 × (2)) + 5
= 14 + 5
= 19
By comparing LHS and RHS
19 = 19
LHS = RHS
Hence, the value of n = 2 is a solution to the given equation 7n + 5 = 19.

(d) 4p – 3 = 13 (p = 1)
Solution:-
LHS = 4p - 3
By substituting the value of p = 1
Then,
LHS = 4p - 3
= (4 × 1) - 3
= 4 - 3
= 1
By comparing LHS and RHS
1 ≠ 13

LHS ≠ 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:-
LHS = 4p - 3
By substituting the value of p = - 4
Then,
LHS = 4p - 3
= (4 × (-4)) - 3
= -16 - 3
= -19
By comparing LHS and RHS
-19 ≠ 13
LHS ≠ 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,
LHS = 4p - 3
= (4 × 0) - 3
= 0 - 3
= -3
By comparing LHS and RHS
- 3 ≠ 13
LHS ≠ 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:-
LHS = 5p + 2
By substituting the value of p = 0
Then,

LHS = 5p + 2
= (5 × 0) + 2
= 0 + 2
= 2
By comparing LHS and RHS
2 ≠ 17
LHS ≠ RHS
Hence, the value of p = 0 is not a solution to the given equation.

Let, p = 1
LHS = 5p + 2
= (5 × 1) + 2
= 5 + 2
= 7
By comparing LHS and RHS
7 ≠ 17
LHS ≠ RHS
Hence, the value of p = 1 is not a solution to the given equation.

Let, p = 2
LHS = 5p + 2
= (5 × 2) + 2
= 10 + 2
= 12
By comparing LHS and RHS
12 ≠ 17
LHS ≠ RHS
Hence, the value of p = 2 is not a solution to the given equation.

Let, p = 3
LHS = 5p + 2
= (5 × 3) + 2
= 15 + 2
= 17
By comparing LHS and RHS
17 = 17
LHS = 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,

LHS = 3m - 14

= (3 × 3) - 14

= 9 - 14

= - 5

By comparing LHS and RHS

-5 ≠ 4

LHS ≠ RHS

Hence, the value of m = 3 is not a solution to the given equation.

Let, m = 4

LHS = 3m - 14

= (3 × 4) - 14

= 12 - 14

= - 2

By comparing LHS and RHS

-2 ≠ 4

LHS ≠ RHS

Hence, the value of m = 4 is not a solution to the given equation.

Let, m = 5

LHS = 3m - 14

= (3 × 5) - 14

= 15 - 14

= 1

By comparing LHS and RHS

1 ≠ 4

LHS ≠ RHS

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

Let, m = 6

LHS = 3m - 14
= (3 × 6) - 14
= 18 - 14
= 4
By comparing LHS and RHS
4 = 4
LHS = 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-fourth of t is 15.
Solution:-
The above statement can be written in the equation form as,
= ¾t = 15

(vi) Seven times m plus 7 gets you 77.

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

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 × Number of Parmit's marbles + 7 = Total number of marbles Irfan having
= (5 × 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

= 3 × Laxmi's age + 4 = Age of Lakshmi's father
= (3 × y) + 4 = 49
= 3y + 4 = 49

(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
= 2 × Lowest score + 7 = Highest score in the class
= (2 × l) + 7 = 87
= 2l + 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^o
Let base angle be b
Then,
Vertex angle = 2 × base angle = 2b
= b + b + 2b = 180^o
= 4b = 180^o