eSaral

CLASS VIII: Maths

Chapter 2: Linear Equations in One Variable

Questions and Solutions | Exercise 2.1 - NCERT Books

Question 1. Find the value of x : 3x = 2x + 18

Solution:

3x – 2x =18 (transposing 2x to LHS)

X = 18 (solution)

Verification — Put the value of x in the equation to verify our solution

3(18) = 2(18) + 18

54 = 36 + 18

54 = 54

LHS = RHS (so our value of x is correct)

Question 2. Find the value of t : 5t – 3 = 3t – 5

Solution:

5t – 3 – 3t = -5 (transposing 3t to LHS)

5t – 3t = -5 + 3 (transposing 3 to RHS)

2t = -2

t = -1 (solution)

Verification — Put the value of t in the equation to verify our solution

5(-1) – 3 = 3(-1) – 5

-5 – 3 = -3 – 5

-8 = -8

LHS = RHS (so our value of t is correct)

Question 3. Find the value of x: 5x + 9 = 5 + 3x

Solution:

5x + 9 – 3x = 5 (transposing 3x to LHS)

5x – 3x = 5 – 9 (transposing 9 to RHS)

2x = -4

x = -2 (solution)

Verification -Put the value of x in the equation to verify our solution

5(-2) + 9 = 5 + 3(-2)

-10 + 9 = 5 -6

-1 = -1

LHS = RHS(so our value of x is correct)

Question 4. Find the value of z: 4z + 3 = 6 + 2z

Solution:

4z +3 – 2z =6 (transposing 2z to LHS)

4z – 2z = 6 – 3 (transposing 3 to RHS)

2z = 3

z = 3/2 (solution)

Verification — Put the value of z in the equation to verify our solution

4(3/2) + 3 = 6 + 2(3/2)

6 + 3 = 6 + 3

9 = 9

LHS = RHS (so our value of z is correct)

Question 5. Find the value of x: 2x – 1 = 14 – x

Solution:

2x – 1 + x = 14 (transposing x to LHS)

2x + x = 14 + 1 (transposing 1 to RHS)

3x = 15

 x = 5 (solution)

Verification — Put the value of x in the equation to verify our solution

2(5) – 1 = 14 – 5

10 – 1 = 14 -5

9 = 9

LHS = RHS (so our value of x is correct)

Question 6. Find the value of x: 8x + 4 = 3 (x – 1) + 7

Solution:

8x + 4 = 3x – 3 + 7 (solving RHS)

8x + 4 – 3x = – 3 + 7 (transposing 3x to LHS)

8x – 3x = – 3 + 7– 4 (transposing 4 to RHS)

5x = 0

x = 0 (solution)

Verification — Put the value of x in the equation to verify our solution

8(0) +4 = 3(0-1) + 7

0 + 4 = -3 +7

4 = 4

LHS = RHS (so our value of x is correct)

Question 7. Find the value of x: x = 4/5 (x + 10)

Solution:

5x = 4 (x + 10)

5x = 4x + 40

5x – 4x = 40 (transposing 4x to LHS)

x = 40 (solution)

Verification — Put the value of x in the equation to verify our solution

40 = 4/5 (40 +10)

40 = 4(50)/5

40 = 40

LHS = RHS (so our value of x is correct)

Question 8. Find the value of x: 2x/3 + 1 = 7x/15 + 3

Solution:

(2x + 3) / 3 = (7x + 45) / 15 (solving LHS and RHS)

15 (2x + 3) = 3 (7x + 45) (transposing 15 and 3)

30x + 45 = 21x + 135 (solving brackets)

30x + 45 – 21x = 135 (transposing 21x to LHS)

30x – 21x = 135 – 45 (transposing 45 to RHS)

9x = 90

x = 10(solution)

Verification — Put the value of x in the equation to verify our solution

2(10)/3 + 1 = 7(10)/15 + 3

20/3 + 1 = 14/3 + 3

23/3 = 23/3

LHS = RHS (so our value of x is correct)

Question 9. Find the value of y: 2y + 5/3 = 26/3 – y

Solution:

(6y + 5) / 3 = (26 – 3y) / 3(canceling 3 at denominator from both sides)

6y + 5 = 26 – 3y(solving brackets)

6y + 5 + 3y = 26 (transposing 3y to LHS)

9y = 26 – 5 (transposing 5 to RHS)

9y = 21

y = 7/3 (solution)

Verification — Put the value of y in the equation to verify our solution

2(7/3) + 5/3 = 26/3 – 7/3

(14 + 5)/3 = (26 – 7)/3

19/3 = 19/3

LHS = RHS (so our value of y is correct)

Question 10. Find the value of m: 3m = 5m – 8/5

Solution:

3m = 25m -8/5

15m = 25m – 8

15m – 25m = -8 (transposing 25m to LHS)

-10m = -8

m = 8/10 or m = 4/5 (solution)

Verification — Put the value of m in the equation to verify our solution

3(4/5) = 5(4/5) – 8/5

12/5 = 20/5 – 8/5

12/5 = 12/5

LHS = RHS (so our value of m is correct)

Questions and Solutions | Exercise 2.2 - NCERT Books

Question 1. x/2 – 1/5 = x/3 + 1/4

Solution:

(5x – 2)/10 = (4x + 3)/12   …(Taking LCM on both the sides)

12(5x – 2) = 10 (4x + 3) …(Cross multiplying)

60x – 24 = 40x + 30   …(Solving the brackets)

60x – 40x = 30 + 24 …(Transposing terms of x to LHS and others to RHS)

20x = 54

x = 54/20 or 27/10 … (Solution)

Verification:

Putting value of "x" in the equation to check if our answer is correct

27/20 – 1/5 = 27/30 + 1/4

(27 – 4)/20 = (108 + 30)/120

23/20 = 138/120

23/20 = 23/20

LHS = RHS (Hence Proved that solution is correct)

Question 2. n/2 – 3n/4 + 5n/6 = 21

Solution:

(6n – 9n + 10n)/12 = 21   …(Taking LCM and solving LHS)

7n/12 = 21 (Solving LHS)

7n = 21 × 12

n = 36 …(Solution)

Verification:

Putting value of "n" in the equation to check if our answer is correct

36/2 – 108/4 + 180/6 = 21

18 – 27 + 30 = 21

21 = 21

LHS = RHS (Hence Proved that solution is correct)

Question 3. x + 7 – 8x/3 = 17/6 – 5x/2

Solution:

x – 8x/3 + 5x/2 = 17/6 – 7 …(Transposing terms of x to LHS and others to RHS)

(6x – 16x + 15x)/6 = (17 – 42)/6 …(Taking LCM and solving)

5x/6 = -25/6

x = -5 …(Solution)

Verification –

Putting value of "x" in the equation to check if our answer is correct

-5 + 7 – (-40)/3 = 17/6 – (-25)/2

2 + 40/3 = 17/6 + 25/2

46/3 = (17 + 75)/6

46/3 = 92/6

46/3 = 46/3

LHS = RHS (Hence Proved that solution is correct)

Question 4. (x – 5)/3 = (x – 3)/5

Solution:

5(x – 5) = 3(x – 3) …(Cross multiply)

5x – 25 = 3x – 9

2x = 16

x = 8 …(Solution)

Verification –

Putting value of "x" in the equation to check if our answer is correct

(8 – 5)/3 = (8 – 3)/5

3/3 = 5/5

1 = 1

LHS = RHS (Hence Proved that solution is correct)

Question 5. (3t – 2)/4 – (2t + 3)/3 = 2/3 – t

Solution:

3t/4 – 1/2 – 2t/3 -1 = 2/3 – t …(Solving brackets)

3t/4 – 2t/3 + t = 2/3 + 1 + 1/2 …(Transposing terms of x to LHS and others to RHS)

(9t – 8t + 12t)/12 = (4 + 6 + 3)/6 …(Taking LCM both sides)

13t/12 = 13/6

t = 2   …(Solution)

Verification –

Putting value of "t" in the equation to check if our answer is correct

(3 × 2 – 2)/4 – (2 × 2 + 3)/3 = 2/3 – 2

4/4 – 7/3 = 2/3 – 2

(12 – 28)/12 = (2 – 6)/3

-16/12 = -4/3

-4/3 = -4/3

LHS = RHS (Hence Proved that solution is correct)

Question 6. m – (m – 1)/2 = 1 – (m – 2)/3

Solution:

(2m – m + 1)/2 = (3 – m + 2)/3 …(Taking LCM both sides)

(m + 1)/2 = (5 – m)/3

3(m + 1) = 2(5 – m) …(Cross multiplying)

3m + 3 = 10 – 2m

5m = 7

m = 7/5 …(Solution)

Verification –

Putting value of "m" in the equation to check if our answer is correct

7/5 – (7/5 – 1)/2 = 1 – (7/5 – 2)/3

7/5 – 1/5 = 1 – (-3)/15

6/5 = 1 + 1/5

6/5 = 6/5

LHS = RHS (Hence Proved that solution is correct)

Question 7. 3(t – 3) = 5(2t + 1)

Solution:

3t – 9 = 10t + 5 …(Opening brackets)

3t – 10t = 9 + 5

-7t = 14

t = -2 …(Solution)

Verification –

Putting value of "t" in the equation to check if our answer is correct

3(-2 – 3) = 5(2(-2) + 1)

3(-5) = 5(-4 +1)

-15 = -15

LHS = RHS (Hence Proved that solution is correct)

Question 8. 15(y – 4) – 2(y – 9) + 5(y + 6) = 0

Solution:

15y – 60 – 2y + 18 + 5y + 30 = 0

18y – 12 = 0

y = 12/18 or 2/3 …(Solution)

Verification –

Putting value of "y" in the equation to check if our answer is correct

15(2/3 – 4) – 2(2/3 – 9) + 5(2/3 + 6) = 0

10 – 60 – 4/3 +18 + 10/3 + 30 = 0

-50 -4/3 + 48 + 10/3 = 0

-2 + 6/3 = 0

-2 + 2 = 0

0 = 0

LHS = RHS (Hence Proved that solution is correct)

Question 9. 3(5z – 7) – 2(9z – 11) = 4(8z – 13) – 17

Solution:

15z – 21 – 18z + 22 = 32z – 52 – 17 …(Solving the brackets)

-3z + 1 = 32z – 69

-35z = -70

z = 2 …(Solution)

Verification –

Putting value of "z" in the equation to check if our answer is correct

3(5(2) – 7) – 2(9(2) – 11) = 4(8(2) – 13) – 17

3(3) – 2(7) = 4(3) – 17

9 – 14 = 12 – 17

-5 = -5

LHS = RHS (Hence Proved that solution is correct)

Question 10. 0.25(4f – 3) = 0.05(10f – 9)

Solution:

f – 0.25(3) = 0.5f – 0.05(9)

f – 0.75 = 0.5f – 0.45

0.5f = 0.75 – 0.45

f = 3/5 or 0.6 (Solution)

Verification –

Putting value of "f" in the equation to check if our answer is correct

0.25(4(0.6) – 3) = 0.05(10(0.6) – 9)

0.25(2.4 – 3) = 0.05(6 – 9)

0.25 × (-0.6) = 0.05 × (-3)

-0.15 = -0.15

LHS = RHS (Hence Proved that solution is correct)