EXERCISE 8.3 **PAGE NO: 8.19**

Solve each of the following equations. Also, verify the result in each case.
1. 6x + 5 = 2x + 17

Solution:
Given 6x + 5 = 2x + 17
Transposing 2x to LHS and 5 to RHS, we get
6x – 2x = 17 – 5
4x = 12
Dividing both sides by 4, we get
4x/4 = 12/4
x = 3
Verification:
Substituting x = 3 in the given equation, we get
6 × 3 + 5 = 2 × 3 + 17
18 + 5 = 6 + 17
23 = 23
Therefore LHS = RHS
Hence, verified.

2. 2 (5x – 3) – 3 (2x – 1) = 9

Solution:
Given 2 (5x – 3) – 3 (2x – 1) = 9
Simplifying the brackets, we get
2 × 5x – 2 × 3 – 3 × 2x + 3 × 1 = 9
10x – 6 - 6x + 3 = 9
10x – 6x – 6 + 3 = 9
4x – 3 = 9
Adding 3 to both sides, we get
4x – 3 + 3 = 9 + 3
4x = 12
Dividing both sides by 4, we get
4x/4 = 12/4
Therefore x = 3.

Verification:
Substituting x = 3 in LHS, we get
2(5 × 3 – 3) – 3(2 × 3 – 1) = 9
2 × 12 – 3 × 5 = 9
24 – 15 = 9
9 = 9
Thus, LHS = RHS
Hence, verified.

3. (x/2) = (x/3) + 1

Solution:
Given (x/2) = (x/3) + 1
Transposing (x/3) to LHS we get
(x/2) – (x/3) = 1
(3x – 2x)/6 = 1 [LCM of 3 and 2 is 6]
x/6 = 1
Multiplying 6 to both sides we get,
x = 6
Verification:
Substituting x = 6 in given equation we get
(6/2) = (6/3) + 1
3 = 2 + 1
3 = 3
Thus LHS = RHS
Hence, verified.

4. (x/2) + (3/2) = (2x/5) - 1

Solution:
Given (x/2) + (3/2) = (2x/5) - 1
Transposing (2x/5) to LHS and (3/2) to RHS, then we get
(x/2) – (2x/5) = - 1 – (3/2)
(5x -4x)/10 = (-2 – 3)/2 [LCM of 5 and 2 is 10]
x/10 = -5/2
Multiplying both sides by 10 we get,
x/10 × 10 = (-5/2) × 10

x = (-50/2)
x = -25
Verification:
Substituting x = -25 in given equation we get
(-25/2) + (3/2) = (-50/5) – 1
(-25 + 3)/2 = -10 – 1
(-22/2) = -11
-11 = -11
Thus LHS = RHS
Hence, verified.

5. (3/4) (x -1) = (x – 3)

Solution:
Given (3/4) (x -1) = (x – 3)
On simplifying the brackets both sides we get,
(3/4) x – (3/4) = (x – 3)
Now transposing (3/4) to RHS and (x – 3) to LHs
(3/4) x – x = (3/4) – 3
(3x – 4x)/4 = (3 – 12)/4
-x/4 = (-9/4)
Multiply both sides by -4 we get
-x/4 × -4 = (-9/4) × -4
x = 9
Verification:
Substituting x = 9 in the given equation:
(3/4) (9 – 1) = (9 -3)
(3/4) (8) = 6
3 × 2 = 6
6 = 6
Thus LHS = RHS
Hence, verified.

6. 3 (x – 3) = 5 (2x + 1)

Solution:
Given 3 (x – 3) = 5 (2x + 1)

On simplifying the brackets we get,
3x – 9 = 10x + 5
Now transposing 10x to LHS and 9 to RHs
3x – 10x = 5 + 9
-7x = 14
Now dividing both sides by -7 we get
-7x/-7 = 14/-7
x = -2
Verification:
Substituting x = -2 in the given equation we get
3 (-2 – 3) = 5 (-4 + 1)
3 (-5) = 5 (-3)
-15 = - 15
Thus LHS = RHS
Hence, verified.

7. 3x – 2 (2x -5) = 2 (x + 3) – 8

Solution:
Given 3x – 2 (2x -5) = 2 (x + 3) – 8
On simplifying the brackets on both sides, we get
3x – 2 × 2x + 2 × 5 = 2 × x + 2 × 3 – 8
3x – 4x + 10 = 2x + 6 – 8
-x + 10 = 2x – 2
Transposing x to RHS and 2 to LHS, we get
10 + 2 = 2x + x
3x = 12
Dividing both sides by 3, we get
3x/3 = 12/3
x = 4
Verification:
Substituting x = 4 on both sides, we get
3(4) – 2{2(4) – 5} = 2(4 + 3) – 8
12 – 2(8 – 5) = 14 – 8
12 – 6 = 6
6 = 6
Thus LHS = RHS

Hence, verified.

8. x – (x/4) – (1/2) = 3 + (x/4)

Solution:
Given x – (x/4) – (1/2) = 3 + (x/4)
Transposing (x/4) to LHS and (1/2) to RHS
x – (x/4) - (x/4) = 3 + (1/2)
(4x – x – x)/4 = (6 + 1)/2
2x/4 = 7/2
x/2 = 7/2
x = 7
Verification:
Substituting x = 7 in the given equation we get
7 – (7/4) – (1/2) = 3 + (7/4)
(28 – 7 – 2)/4 = (12 + 7)/4
19/4 = 19/4
Thus LHS = RHS
Hence, verified.

9. (6x – 2)/9 + (3x + 5)/18 = (1/3)

Solution:
Given (6x – 2)/9 + (3x + 5)/18 = (1/3)
(6x (2) – 2 (2) + 3x + 5)/18 = (1/3)
(12x – 4 + 3x + 5)/18 = (1/3)
(15x + 1)/ 18 = (1/3)
Multiplying both sides by 18 we get
(15x + 1)/18 × 18 = (1/3) × 18
15x + 1 = 6
Transposing 1 to RHS, we get
= 15x = 6 – 1
= 15x = 5
Dividing both sides by 15, we get
= 15x/15 = 5/15
=x = 1/3
Verification:

Substituting x = 1/3 both sides, we get
(6 (1/3) – 2)/9 + (3 (1/3) + 5)/18 = (1/3)
(2 – 2)/9 + (1 + 5)/ 18 = 1/3
(6/18) = (1/3)
(1/3) = (1/3)
Thus LHS = RHS
Hence, verified.

10. m – (m – 1)/2 = 1 – (m – 2)/3

Solution:
Given m – (m – 1)/2 = 1 – (m – 2)/3
(2m – m + 1)/2 = (3 – m + 2)/3
(m + 1)/2 = (5 – m)/3
(m + 1)/2 = (5/3) – (m/3)
(m/2) + (1/2) = (5/3) – (m/3)
Transposing (m/3) to LHS and (1/2) to RHS
(m/2) + (m/3) = (5/3) – (1/2)
(3m + 2m)/6 = (10 – 3)/6
5m/6 = (7/6)
5m = 7
Dividing both sides by 5, we get
5m/5 = 7/5
m = 7/5
Verification:
Substituting m = 7/5 on both sides, we get
(7/5) – (7 – 5)/10 = 1 – (7 - 10)/15
(7/5) – (2/10) = (15 + 3)/15
(14 – 2)/10 = (15 + 3)/15
12/10 = 18/15
(6/5) = (6/5)
Thus LHS = RHS
Hence, verified.

11. (5x – 1)/3 – (2x – 2)/3 = 1

Solution:

Given (5x – 1)/3 – (2x – 2)/3 = 1
(5x – 1 – 2x + 2)/3 = 1
(3x + 1)/3 = 1
Multiplying both sides by 3 we get
(3x + 1)/3 × 3 = 1 × 3
(3x + 1) = 3
Subtracting 1 from both sides we get
3x + 1 – 1 = 3 – 1
3x = 2
Dividing both sides by 3, we get
3x/3 = 2/3
x = 2/3
Verification:
Substituting x = 2/3 in LHS, we get
(5 (2/3) – 1)/3 – (2 (2/3) – 2)/3 = 1
(10/3 -1)/3 – (4/3 – 2)/3 = 1
(7/3)/3 – (-2/3)/3 = 1
(7/9) + (2/9) = 1
(9/9) = 1
1 = 1
Thus LHS = RHS
Hence, verified.

12. 0.6x + 4/5 = 0.28x + 1.16

Solution:
Given 0.6x + 4/5 = 0.28x + 1.16
Transposing 0.28x to LHS and 45 to RHS, we get
0.6x – 0.28x = 1.16 – 45
0.32x = 1.16 – 0.8
0.32x = 0.36
Dividing both sides by 0.32, we get
0.32 x 0.32 = 0.360.32
x = 9/8

Verification:
Substituting x = 9/8 on both sides, we get
0.6(9/8) + 45 = 0.28(9/8) + 1.16
5.4/8 + 4/5 = 2.52/8 + 1.16
0.675 + 0.8 = 0.315 + 1.16
1.475 = 1.475
Thus LHS = RHS
Hence, verified.

13. 0.5x + (x/3) = 0.25x + 7

Solution:
Given 0.5x + (x/3) = 0.25x + 7
(5/10) x + (x/3) = (25x/100) + 7
(x/2) + (x/3) = (x/4) + 7
Transposing (x/4) to LHS we get
(x/2) + (x/3) – (x/4) = 7
(6x + 4x – 3x)/12 = 7
(7x/12) = 7
Multiplying both sides by 12 we get
(7x/12) × 12 = 7 × 12
7x = 84
Dividing both sides by 7 we get
(7x/7) = (84/7)
x = 12
Verification:
Substituting x = 12 in given equation we get
0.5 (12) + (12/3) = 0.25 (12) + 7
6 + 4 = 3 + 7
10 = 10
Thus LHS = RHS
Hence, verified.