EXERCISE 8.2 PAGE NO: 8.12

Solve each of the following equations and check your answers:

1. x – 3 = 5

Solution:

Given x – 3 = 5

Adding 3 to both sides we get,

x – 3 + 3 = 5 + 3

x = 8

Verification:

Substituting x = 8 in LHS, we get

LHS = x – 3 and RHS = 5

LHS = 8 – 3 = 5 and RHS = 5

LHS = RHS

Hence, verified.

2. x + 9 = 13

Solution:

Given x + 9 = 13

Subtracting 9 from both sides i.e. LHS and RHS, we get

x + 9 – 9 = 13 – 9

x = 4

Verification:

Substituting x = 4 on LHS, we get

LHS = 4 + 9 = 13 = RHS

LHS = RHS

Hence, verified.

3. x – (3/5) = (7/5)

Solution:

Given x – (3/5) = (7/5)

Add (3/5) to both sides, we get

x – (3/5) + (3/5) = (7/5) + (3/5)

x = (7/5) + (3/5)

x = (10/5)
x = 2
Verification:
Substitute x = 2 in LHS of given equation, then we get
2 – (3/5) = (7/5)
(10 – 3)/5 = (7/5)
(7/5) = (7/5)
LHS = RHS
Hence, verified

4. 3x = 0

Solution:
Given 3x = 0
On dividing both sides by 3 we get,
(3x/3) = (0/3)
x = 0
Verification:
Substituting x = 0 in LHS we get
3 (0) = 0
And RHS = 0
Therefore LHS = RHS
Hence, verified.

5. (x/2) = 0

Solution:
Given x/2 = 0
Multiplying both sides by 2, we get
(x/2) × 2 = 0 × 2
x = 0
Verification:
Substituting x = 0 in LHS, we get
LHS = 0/2 = 0 and RHS = 0
LHS = 0 and RHS = 0
Therefore LHS = RHS
Hence, verified.

6. x – (1/3) = (2/3)

Solution:
Given x – (1/3) = (2/3)
Adding (1/3) to both sides, we get
x – (1/3) + (1/3) = (2/3) + (1/3)
x = (2 + 1)/3
x = (3/3)
x =1
Verification:
Substituting x = 1 in LHS, we get
1 – (1/3) = (2/3)
(3 – 1)/3 = (2/3)
(2/3) = (2/3)
Therefore LHS = RHS
Hence, verified.

7. x + (1/2) = (7/2)

Solution:
Given x + (1/2) = (7/2)
Subtracting (1/2) from both sides, we get
x + (1/2) – (1/2) = (7/2) – (1/2)
x = (7 – 1)/2
x = (6/2)
x = 3
Verification:
Substituting x = 3 in LHS we get
3 + (1/2) = (7/2)
(6 + 1)/2 = (7/2)
(7/2) = (7/2)
Therefore LHS = RHS
Hence, verified.

8. 10 – y = 6

Solution:

Given 10 – y = 6
Subtracting 10 from both sides, we get
10 – y – 10 = 6 – 10
-y = -4
Multiplying both sides by -1, we get
-y × -1 = - 4 × - 1
y = 4
Verification:
Substituting y = 4 in LHS, we get
10 – y = 10 – 4 = 6 and RHS = 6
Therefore LHS = RHS
Hence, verified.

9. 7 + 4y = -5

Solution:
Given 7 + 4y = -5
Subtracting 7 from both sides, we get
7 + 4y – 7 = -5 -7
4y = -12
Dividing both sides by 4, we get
y = -12/ 4
y = -3
Verification:
Substituting y = -3 in LHS, we get
7 + 4y = 7 + 4(-3) = 7 – 12 = -5, and RHS = -5
Therefore LHS = RHS
Hence, verified.

10. (4/5) – x = (3/5)

Solution:
Given (4/5) – x = (3/5)
Subtracting (4/5) from both sides, we get
(4/5) – x – (4/5) = (3/5) – (4/5)
- x = (3 -4)/5
- x = (-1/5)

x = (1/5)
Verification:
Substituting x = (1/5) in LHS we get
(4/5) – (1/5) = (3/5)
(4 -1)/5 = (3/5)
(3/5) = (3/5)
Therefore LHS =RHS
Hence, verified.

11. 2y – (1/2) = (-1/3)

Solution:
Given 2y – (1/2) = (-1/3)
Adding (1/2) from both the sides, we get
2y – (1/2) + (1/2) = (-1/3) + (1/2)
2y = (-1/3) + (1/2)
2y = (-2 + 3)/6 [LCM of 3 and 2 is 6]
2y = (1/6)
Now divide both the side by 2, we get
y = (1/12)
Verification:
Substituting y = (1/12) in LHS we get
2 (1/12) – (1/2) = (-1/3)
(1/6) – (1/2) = (-1/3)
(2 – 6)/12 = (-1/3) [LCM of 6 and 2 is 12]
(-4/12) = (-1/3)
(-1/3) = (-1/3)
Therefore LHS = RHS
Hence, verified.

12. 14 = (7x/10) – 8

Solution:
Given 14 = (7x/10) – 8
Adding 8 to both sides we get,
14 + 8 = (7x/10) – 8 + 8
22 = (7x/10)

Multiply both sides by 10 we get,
220 = 7x
x = (220/7)
Verification:
Substituting x = (220/7) in RHS we get,
14 = (7/10) × (220/7) – 8
14 = 22 -8
14 = 14
Therefore LHS = RHS.
Hence, verified.

13. 3 (x + 2) = 15

Solution:
Given 3 (x + 2) = 15
Dividing both sides by 3 we get,
3 (x + 2)/3 = (15/3)
(x + 2) = 5
Now subtracting 2 by both sides, we get
x + 2 -2 = 5 -2
x = 3
Verification:
Substituting x =3 in LHS we get,
3 (3 + 2) = 15
3 (5) = 15
15 = 15
Therefore LHS = RHS
Hence, verified.

14. (x/4) = (7/8)

Solution:
Given (x/4) = (7/8)
Multiply both sides by 4 we get,
(x/4) × 4 = (7/8) × 4
x = (7/2)
Verification:

Substituting x = (7/2) in LHS we get,
(7/2)/4 = (7/8)
(7/8) = (7/8)
Therefore LHS = RHS
Hence, verified.

15. (1/3) – 2x = 0

Solution:
Given (1/3) – 2x = 0
Subtract (1/3) from both sides we get,
(1/3) – 2x – (1/3) = 0 – (1/3)
- 2x = - (1/3)
2x = (1/3)
Divide both side by 2 we get,
2x/2 = (1/3)/2
x = (1/6)
Verification:
Substituting x = (1/6) in LHS we get,
(1/3) – 2 (1/6) = 0
(1/3) – (1/3) = 0
0 = 0
Therefore LHS = RHS
Hence, verified.

16. 3 (x + 6) = 24

Solution:
Given 3 (x + 6) = 24
Divide both the sides by 3 we get,
3 (x + 6)/3 = (24/3)
(x + 6) = 8
Now subtract 6 from both sides we get,
x + 6 – 6 = 8 – 6
x = 2
Verification:
Substituting x = 2 in LHS we get,

3 (2 + 6) = 24
3 (8) =24
24 = 24
Therefore LHS =RHS
Hence, verified.

17. 3 (x + 2) – 2 (x – 1) = 7

Solution:
Given 3 (x + 2) – 2 (x – 1) = 7
On simplifying the brackets, we get
3 × x + 3 × 2 – 2 × x + 2 × 1 = 7
3x + 6 – 2x + 2 = 7
3x – 2x + 6 + 2 = 7
x + 8 = 7
Subtracting 8 from both sides, we get
x + 8 – 8 = 7 – 8
x = -1
Verification:
Substituting x = -1 in LHS, we get
3 (x + 2) -2(x -1) = 7
3 (-1 + 2) -2(-1-1) = 7
(3×1) – (2×-2) = 7
3 + 4 = 7
Therefore LHS = RHS
Hence, verified.

18. 8 (2x – 5) – 6(3x – 7) = 1

Solution:
Given 8 (2x – 5) – 6(3x – 7) = 1
On simplifying the brackets, we get
(8 × 2x) – (8 × 5) – (6 × 3x) + (-6) × (-7) = 1
16x – 40 – 18x + 42 = 1
16x – 18x + 42 – 40 = 1
-2x + 2 = 1
Subtracting 2 from both sides, we get

-2x+ 2 – 2 = 1 -2
-2x = -1
Multiplying both sides by -1, we get
-2x × (-1) = -1× (-1)
2x = 1
Dividing both sides by 2, we get
2x/2 = (1/2)
x = (1/2)
Verification:
Substituting x = (1/2) in LHS we get,
(8 × (2 × (1/2) – 5) – (6 × (3 × (1/2) - 7) = 1
8(1 – 5) – 6(3/2 – 7) = 1
8× (-4) – (6 × 3/2) + (6 × 7) = 1
-32 – 9 + 42 = 1
– 41 + 42 = 1
1 = 1
Therefore LHS = RHS
Hence, verified.

19. 6 (1 – 4x) + 7 (2 + 5x) = 53

Solution:
Given 6 (1 – 4x) + 7 (2 + 5x) = 53
On simplifying the brackets, we get
(6 ×1) – (6 × 4x) + (7 × 2) + (7 × 5x) = 53
6 – 24x + 14 + 35x = 53
6 + 14 + 35x – 24x = 53
20 + 11x = 53
Subtracting 20 from both sides, we get 20 + 11x – 20 = 53 – 20
11x = 33
Dividing both sides by 11, we get
11x/11 = 33/11
x = 3
Verification:
Substituting x = 3 in LHS, we get
6(1 – 4 × 3) + 7(2 + 5 × 3) = 53
6(1 – 12) + 7(2 + 15) = 53

6(-11) + 7(17) = 53
- 66 + 119 = 53
53 = 53
Therefore LHS = RHS
Hence, verified.

20. 5 (2 – 3x) -17 (2x -5) = 16

Solution:
Given 5 (2 – 3x) -17 (2x - 5) = 16
On expanding the brackets, we get
(5 × 2) – (5 × 3x) – (17 × 2x) + (17 × 5) = 16
10 – 15x – 34x + 85 = 16
10 + 85 – 34x – 15x = 16
95 – 49x = 16
Subtracting 95 from both sides, we get
– 49x + 95 – 95 = 16 – 95
- 49x = -79
Dividing both sides by – 49, we get
- 49x/ -49 = -79/-49
x = 79/49
Verification:
Substituting x = (79/49) in LHS we get,
5 (2 – 3 × (79/49) - 17 (2 × (79/49) - 5) = 16
(5 × 2) – (5 × 3 × (79/49)) – (17 × 2 × (79/49)) + (17 × 5) = 16
10 – (1185/49) – (2686/49) + 85 = 16
(490 – 1185 – 2686 + 4165)/49 = 16
784/49 = 16
16 = 16
Therefore LHS = RHS
Hence, verified.

21. (x – 3)/5 -2 = -1

Solution:
Given ((x – 3)/5) -2 = -1
Adding 2 to both sides we get,

((x -3)/5) – 2 + 2 = -1 + 2
(x -3)/5 = 1
Multiply both sides by 5 we get
(x – 3)/ 5 × 5 = 1 × 5
x – 3 = 5
Now add 3 to both sides we get,
x – 3 + 3 = 5 + 3
x = 8
Verification:
Substituting x = 8 in LHS we get,
((8 – 3)/5) -2 = -1
(5/5) – 2 = -1
1 -2 = -1
-1 = -1
Therefore LHS = RHS
Hence, verified.

22. 5 (x – 2) + 3 (x +1) = 25

Solution:
Given 5 (x – 2) + 3 (x +1) = 25
On simplifying the brackets, we get
(5 × x) – (5 × 2) +3 × x + 3× 1 = 25
5x – 10 + 3x + 3 = 25
5x + 3x – 10 + 3 = 25
8x – 7 = 25
Adding 7 to both sides, we get
8x – 7 + 7 = 25 + 7
8x = 32
Dividing both sides by 8, we get
8x/8 = 32/8
x = 4
Verification:
Substituting x = 4 in LHS, we get
5(4 – 2) + 3(4 + 1) = 25
5(2) + 3(5) = 25
10 + 15 = 25

25 = 25
Therefore LHS = RHS
Hence, verified.