EXERCISE   PAGE: 110

In questions 1 to 15 out of the four options only one is correct, write the correct answer.

1. The solution of which of the following equations is neither a fraction nor an integer.

(a) 3x + 2 = 5x + 2   (b) 4x – 18 = 2

(c) 4x + 7 = x + 2   (d) 5x – 8 = x + 4

Solution:-

(c) 4x + 7 = x + 2

Transposing 7 to RHS and it becomes -7 and x to LHS it becomes -x

$\quad$ 4x – x = 2 – 7

$\quad$ 3x = - 5

$\quad$ X = -5/3

So, -5/3 is neither a fraction nor an integer.

2. The solution of the equation ax + b = 0 is

(a) x = a/b   (b) x = -b

(c) x = -b/a   (d) x = b/a

Solution:-

(c) x = -b/a

Given, ax + b = 0

Transposing b to RHS and it becomes -b

Then,

$\quad$ ax = -b

$\quad$ x = -b/a

3. If 8x – 3 = 25 +17x, then x is

(a) a fraction   (b) an integer

(c) a rational number   (d) cannot be solved

Solution:-

(c) a rational number

Given, 8x – 3 = 25 + 17x

Transposing -3 to RHS and it becomes 3 and 17x to LHS it becomes -17x.

$\quad$ 8x – 17x = 25 + 3

$\quad$ -9x = 28

$\quad$ X = -28/9

Therefore x is a rational number.

4. The shifting of a number from one side of an equation to other is called
(a) Transposition   (b) Distributivity
(c) Commutativity   (d) Associativity
Solution:-
(a) Transposition
The shifting of a number from one side of an equation to other is called Transposition

5. If (5x/3) – 4 = (2x/5), then the numerical value of 2x – 7 is
(a) 19/13   (b) -13/19   (c) 0   (d) 13/19
Solution:-
(b) -13/19
Given, (5x/3) – 4 = (2x/5)
     (5x/3) - (2x/5) = 4
LCM of 3 and 5 is 15
     (25x – 6x)/15 = 4
     19x = 4 × 15
     19x = 60
     X = 60/19
Then, Substitute the value of x in 2x -7
     = (2 × (60/19)) – 7
     = (120/19) – 7
     = (120 - 133)/19
     = - 13/19

6. The value of x for which the expressions 3x – 4 and 2x + 1 become equal is
(a) -3   (b) 0   (c) 5   (d) 13/19
Solution:-
(c) 5
Given, 3x – 4 = 2x + 1
Transposing -4 to RHS and it becomes 4 and 2x to LHS it becomes -2x.
     3x – 2x = 1 + 4
     X = 5

7. If a and b are positive integers, then the solution of the equation ax = b has to be always
(a) positive   (b) negative   (c) one   (d) zero

Solution:-

(a) positive

Let a = 3, b = 4

Then, ax = b

$\qquad$ 3x = 4

$\qquad$ X = 4/3

8. Linear equation in one variable has

(a) only one variable with any power.

(b) only one term with a variable.

(c) only one variable with power 1.

(d) only constant term.

Solution:-

(c) only one variable with power 1.

9. Which of the following is a linear expression:

(a) $x^2 + 1$ $\qquad$**(b) $y + y^2$**$\qquad$**(c) 4**$\qquad$**(d) 1 + z**

Solution:-

(d) 1 + z

The linear expressions is one which having highest power as 1.

10. A linear equation in one variable has

(a) Only one solution

(b) Two solutions

(c) More than two solutions

(d) No solution

Solution:-

(a) Only one solution

11. Value of S in (1/3) + S = 2/5

(a) 4/5$\qquad$**(b) 1/15**$\qquad$**(c) 10**$\qquad$**(d) 0**

Solution:-

(b) 1/15

Given,

$\qquad$ 1/3 + S = 2/5

$\qquad$ S = 2/5 – 1/3

$\qquad$ S = (6 - 5)/15

S = 1/15

12. (-4/3)y = - ¾, then y =
(a) -(¾)²   (b) -(4/3)²   (c) (¾)²   (d) (4/3)²
Solution:-
(c) (¾)²
Given,

    (-4/3)y = -¾
    Y = - ¾ × -¾
    Y = 9/16
    Y = (3 × 3)/(4 × 4)
    Y = 3²/4²
    Y = (¾)²

13. The digit in the tens place of a two digit number is 3 more than the digit in the units place. Let the digit at units place be b. Then the number is
(a) 11b + 30   (b) 10b + 30   (c) 11b + 3   (d) 10b + 3
Solution:-
(a) 11b + 30
From the question it is given that,
Let the digit at units place be b.
The digit in the tens place of a two digit number is 3 more than the digit in the units place = 3 + b
So, the number = 10 (3 + b) + b
                 = 30 + 10b + b
                 = 30 + 11b

14. Arpita's present age is thrice of Shilpa. If Shilpa's age three years ago was x. Then Arpita's present age is
(a) 3(x – 3)   (b) 3x + 3   (c)3x – 9   (d) 3(x + 3)
Solution:-
(d) 3(x + 3)
Given,
Shilpa's age three years ago was x
Then, Shilpa's present age is = x + 3
Arpita's present age is thrice of Shilpa = 3 (x + 3)

15. The sum of three consecutive multiples of 7 is 357. Find the smallest multiple.

(a) 112   **(b) 126**   **(c) 119**   **(d) 116**

Solution:-

(a) 112

Let us assume the three consecutive multiples of 7 be 7x, (7x + 7), (7x + 14) where x is a natural number.

As per the condition in the question,

7x + (7x + 7) + (7x + 14) = 357

$\qquad$ 21x + 21 = 357

$\qquad$ 21(x + 1) = 357

$\qquad$ (21(x + 1))/21 = 357/21

$\qquad$ X + 1 = 17

$\qquad$ X = 17 – 1

$\qquad$ X = 16

Therefore, the smallest multiple of 7 is,

$\qquad$ 7 × 16 = 112.

In questions 16 to 32, fill in the blanks to make each statement true.

16. In a linear equation, the _____ power of the variable appearing in the equation is one.

Solution:-

In a linear equation, the <u>highest</u> power of the variable appearing in the equation is one.

17. The solution of the equation 3x – 4 = 1 – 2 x is _____.

Solution:-

The solution of the equation 3x – 4 = 1 – 2 x is <u>1</u>.

$\qquad$ 3x – 4 = 1 – 2

$\qquad$ 3x – 4 = - 1

$\qquad$ 3x = -1 + 4

$\qquad$ X = 3/3

$\qquad$ X = 1

18. The solution of the equation 2y = 5y – 18/5 is _____.

Solution:-

The solution of the equation 2y = 5y – 18 5 is <u>(6/5)</u>.

$\qquad$ 2y = 5y – (18/5)

(18/5) = 5y – 2y
(18/5) = 3y
y = (18/5) × (1/3)
y = (6/5) × (1/1)
y = 6/5

19. Any value of the variable which makes both sides of an equation equal is known as a _____ of the equation.
Solution:-
Any value of the variable which makes both sides of an equation equal is known as a solution of the equation.

20. 9x – _____ = –21 has the solution (–2)
Solution:-
9x – 3 = –21 has the solution (–2)
In the question it is given that, x = -2
Then, let us assume the missing number be y
  (9 × (-2)) – y = -21
  -18 – y = -21
  - y = -21 + 18
  - y = - 3
  Y = 3

21. Three consecutive numbers whose sum is 12 are _____, _____ and _____.
Solution:-
Three consecutive numbers whose sum is 12 are 3, 4 and 5.
  3 + 4 + 5 = 12

22. The share of A when Rs 25 are divided between A and B so that A gets Rs. 8 more than B is _____.
Solution:-
The share of A when Rs 25 are divided between A and B so that A gets Rs. 8 more than B is Rs 16.50.
Let us assume B share be x
As per the condition in the question A share be x + 8
Then,

x + (x + 8) = 25
x + x + 8 = 25
2x + 8 = 25
2x = 25 – 8
2x = 17
x = 17/2
x = 8.5
So, A gets x + 8
= 8.5 + 8
= Rs 16.5

23. A term of an equation can be transposed to the other side by changing its _____.

Solution:-
A term of an equation can be transposed to the other side by changing its <u>sign</u>.
For example:- 2x + 3 = 0
Transposing 3 to RHS and it becomes -3
2x = -3
X = -3/2

24. On subtracting 8 from x, the result is 2. The value of x is _____.

Solution:-
On subtracting 8 from x, the result is 2. The value of x is <u>10</u>.
From the question,
On subtracting 8 from x, the result is 2,
= x – 8 = 2
Transposing -8 to RHS and it becomes 8
X = 2 + 8
X = 10

25. (x/5) + 30 = 18 has the solution as _____.

Solution:-
(x/5) + 30 = 18 has the solution as <u>-60</u>.
Given, (x/5) + 30 = 18
Transposing 30 to RHS and it becomes -30.
(x/5) = 18 – 30
(x/5) = -12

X = -12 × 5
X = -60

26. When a number is divided by 8, the result is –3. The number is _____.
Solution:-
When a number is divided by 8, the result is –3. The number is <u>-24</u>.
Let the number be x,
Then,

x/8 = -3
x = -3 × 8
x = -24

27. 9 is subtracted from the product of p and 4, the result is 11. The value of p is _____.
Solution:-
9 is subtracted from the product of p and 4, the result is 11. The value of p is <u>5</u>.
From the question, it is given that,
9 is subtracted from the product of p and 4, the result is 11 = 4p – 9 = 11

4p – 9 = 11
Transposing -9 to RHS and it becomes 9.

4p = 11 + 9
4p = 20
P = 20/4
P = 5

28. If (2/5)x – 2 = 5 – (3/5)x, then x = _____.
Solution:-
If (2/5)x – 2 = 5 – (3/5)x, then x = <u>7</u>
Given,

(2/5)x – 2 = 5 – (3/5)x
Transposing -2 to RHS and it becomes 2 and (3/5)x to LHS it becomes –(3/5)x.

(2/5)x + (3/5)x = 5 + 2
(2x + 3x)/5 = 7
5x = 7 × 5
X = 35/5
X = 7

**29. After 18 years, Swarnim will be 4 times as old as he is now. His present age is
_____.**
Solution:-
After 18 years, Swarnim will be 4 times as old as he is now. His present age is <u>6 years</u>.
Let us assume swarnim's parent age be x year.
Then, after 18 year, Swarnim's age = (x + 18) year
According to the question,

$\qquad$ X + 18 = 4x

$\qquad$ X – 4x = -18

$\qquad$ - 3x = -18

$\qquad$ - 3x/3 = (-18/3)

$\qquad$ X = 6

Therefore, swarnim's present age is 6 year.

30. Convert the statement adding 15 to 4 times x is 39 into an equation _____.
Solution:-
Convert the statement Adding 15 to 4 times x is 39 into an equation <u>4x + 15 = 39</u>.

**31. The denominator of a rational number is greater than the numerator by 10. If the
numerator is increased by 1 and the denominator is decreased by 1, then expression
for new denominator is _____.**
Solution:-
The denominator of a rational number is greater than the numerator by 10. If the
numerator is increased by 1 and the denominator is decreased by 1, then expression for
new denominator is <u>x + 9</u>.
Let us assume numerator be x,
So, denominator = x + 10
Rational number = x/(x + 10)
As per the condition given in the question, the numerator is increased by 1 and the
denominator is decreased by 1.
New rational number = Numerator + 1/ (denominator - 1)

$\qquad$ = (x + 1)/(x + 10 - 1)

$\qquad$ = (x + 1)/(x + 9)

∴the new denominator is x + 9.

**32. The sum of two consecutive multiples of 10 is 210. The smaller multiple is
_____.**

Solution:-

The sum of two consecutive multiples of 10 is 210. The smaller multiple is <u>100</u>.
Let us assume the two consecutive multiples of 10 be 10x and 10x + 10.
So,
Sum of two consecutive multiples of 10 = 10x + 10x + 10 = 210
$$20x + 10 = 210$$
$$20x = 210 - 10$$
$$20x = 200$$
$$x = 200/20$$
$$x = 10$$
∵the two consecutive multiples of 10 are 10x = 10 × 10 = 100
$$10x + 10 = (10 × 10) + 10$$
$$= 110$$

Hence, the smaller multiple of 10 is 100.

In questions 33 to 48, state whether the statements are true (T) or false (F).
33. 3 years ago, the age of a boy was y years. His age 2 years ago was (y – 2) years
Solution:-
False.
Because, His age 2 years ago was (y + 1) years.

34. Shikha's present age is p years. Reemu's present age is 4 times the present age of Shikha. After 5 years Reemu's age will be 15p years.
Solution:-
False.
Given,
Shikha's present age is p years
Reemu's present age is 4 times the present age of Shikha = 4p
After 5 years Reemu's age will be = (4p + 5)

35. In a 2 digit number, the units place digit is x. If the sum of digits be 9, then the number is (10x – 9).
Solution:-
False.
From the question it is given that,
The unit's place digit is = x
Sum of two digits = 9

Then,
Ten's digit = 9 – x
So,
The number = 10 (9 - x) + x

$$= 90 – 10x + x$$

$$= 90 – 9x$$

36. Sum of the ages of Anju and her mother is 65 years. If Anju's present age is y years then her mother's age before 5 years is (60 – y) years.
Solution:-
True.
From the question it is given that,
Anju's present age = y years
Present age of Anju's mother = (65 - y) years
Then,
Before 5 years, Anju's mother age = 65 – y – 5

$$= (60 – y) \text{ years}$$

37. The number of boys and girls in a class are in the ratio 5:4. If the number of boys is 9 more than the number of girls, then number of boys is 9.
Solution:-
False.
Let us assume number of boys be 5y and the number of girls be 4y.
From the question,

5x – 4x = 9

X = 9

∴Number of boys = 5x = 5 × 9 = 45 boys
Number of girls = 4x = 4 × 9 = 36 girls.

38. A and B are together 90 years old. Five years ago A was thrice as old as B was. Hence, the ages of A and B five years back would be (x – 5) years and (85 – x) years respectively.
Solution:-
True.
Let us assume age of A be y years.
So, age of B = (90 - y) years.
Then,

Before 5 years A's age = (x - 5) years
and B's age = (90 – x - 5) = (85 - x) years.

39. Two different equations can never have the same answer.
Solution:-
False.
Two different equations can have the same answer
 For example: - (i) 4x + 2 = 3
              4x = 3 – 2
              X = ¼
          (ii) 4x – 6 = - 5
              4x = - 5 + 6
              X = ¼

40. In the equation 3x – 3 = 9, transposing –3 to RHS, we get 3x = 9.
Solution:-
False.
Given, 3x – 3 = 9
Transposing –3 to RHS it becomes 3
      3x = 9 + 3
      3x = 12

41. In the equation 2x = 4 – x, transposing –x to LHS, we get x = 4.
Solution:-
False.
Given, 2x = 4 – x
Transposing –x to LHS it becomes x
      2x + x = 4
      3x = 4
      X = 3/4

42. If (15/8) – 7x = 9, then -7x = 9 + (15/8)
Solution:-
False.
Given, (15/8) – 7x = 9
Transposing 15/8 to RHS it becomes – (15/8)
      - 7x = 9 – (15/8)

43. If (x/3) + 1 = (7/15), then x/3 = 6/15

Solution:-

False.

Given, (x/3) + 1 = (7/15)

Transposing 1 to RHS it becomes – 1

   (x/3) = (7/15) – 1

   (x/3) = (7 - 15)/15

   (x/3) = -8/15

44. If 6x = 18, then 18x = 54

Solution:-

True.

Given, 6x = 18

Multiplying both LHS and RHS by 3, we get

   6x × 3 = 18 × 3

   18x = 54

45. If x/11 = 15, then x = 11/15

Solution:-

False.

Given, x/11 = 15

Multiplying both LHS and RHS by 11, we get

   (x/11) × 11 = 15 × 11

   X = 165

46. If x is an even number, then the next even number is 2(x + 1).

Solution:-

False.

If x is an even number, then the next even number is (x + 2)

47. If the sum of two consecutive numbers is 93 and one of them is x, then the other number is 93 – x.

Solution:-

False.

From the question,

The sum of two consecutive numbers is 93

Two consecutive number are = x and 93 – x

Then, sum of two consecutive numbers = x + (93 - x) = 93

$$X + 93 - x = 93$$

Transposing 93 to RHS it becomes – 93

$$x - x = 93 - 93$$
$$0 = 0$$

48. Two numbers differ by 40, when each number is increased by 8, the bigger becomes thrice the lesser number. If one number is x, then the other number is (40 – x).

Solution:-

False.

From the question it is given that,

One number = x

Other number = 40 –x

Let us assume (40 – x) > x

So, 40 – x + 8 = 3 (x + 8)

$$48 - x = 3x + 24$$
$$- x - 3x = 24 - 48$$
$$- 4x = -24$$
$$X = -24 \times (-1/4)$$
$$X = 6$$

∴One number is x = 6

Other number is = 40 – x

$$= 40 - 6$$
$$= 34$$

Difference between numbers = 34 – 6 = 28

Solve the following:

49. ((3x - 8)/2x) = 1

Solution:-

We have,

$$((3x - 8)/2x) = 1$$

By cross multiplication, we get

$$(3x - 8) = 2x$$

Transposing -8 to RHS it becomes 8 and 2x to LHS it becomes – 2x

$$3x - 2x = 8$$
$$x = 8$$

50. (5x/(2x - 1)) = 2
Solution:-
We have,

$\quad$ (5x/(2x - 1)) = 2

By cross multiplication, we get

$\quad$ 5x = 2 × (2x - 1)

$\quad$ 5x = 4x – 2

Transposing 4x to LHS it becomes – 4x

$\quad$ 5x – 4x = -2

$\quad$ x = -2

51. ((2x - 3)/(4x + 5)) = (1/3)
Solution:-
We have,

$\quad$ ((2x - 3)/(4x + 5)) = (1/3)

By cross multiplication, we get

$\quad$ 3 × (2x - 3) = 1 × (4x + 5)

$\quad$ 6x – 9 = 4x + 5

Transposing -9 to RHS it becomes 9 and 4x to LHS it becomes – 4x.

$\quad$ 6x – 4x = 5 + 9

$\quad$ 2x = 14

$\quad$ x = 14/2

$\quad$ x = 7

52. (8/x) = (5/(x - 1))
Solution:-
We have,

$\quad$ (8/x) = (5/(x - 1))

By cross multiplication, we get

$\quad$ 8 × (x - 1) = 5 × x

$\quad$ 8x – 8 = 5x

Transposing -8 to RHS it becomes 8 and 5x to LHS it becomes – 5x.

$\quad$ 8x – 5x = 8

$\quad$ 3x = 8

$\quad$ X = 8/3

53. [(5(1 - x)) + (3(1 + x))/ (1 – 2x)] = 8

Solution:-
We have,

$[(5(1 - x)) + (3(1 + x))/ (1 – 2x)] = 8$

By cross multiplication, we get

$(5(1 - x)) + (3(1 + x)) = 8 \times (1 – 2x)$

$5 – 5x + 3 + 3x = 8 – 16 x$

$8 – 2x = 8 – 16x$

Transposing 8 to RHS it becomes - 8 and -16x to LHS it becomes 16x.

$16x – 2x = 8 – 8$

$14x = 0$

$x = 0/14$

$x = 0$

54. $((0.2x + 5)/ (3.5x - 3)) = (2/5)$
Solution:-
We have,

$((0.2x + 5)/ (3.5x - 3)) = (2/5)$

By cross multiplication, we get

$5 \times (0.2x + 5) = 2 \times (3.5x - 3)$

$x + 25 = 7x - 6$

Transposing x to RHS it becomes - x and -6 to LHS it becomes 6.

$25 + 6 = 7x – x$

$31 = 6x$

$x = 31/6$

55. $[(y – (4 – 3y))/ (2y – (3 + 4y))] = 1/5$
Solution:-
We have,

$[(y – (4 – 3y))/ (2y – (3 + 4y))] = 1/5$

$(y – 4 + 3y)/ (2y – 3 - 4y) = 1/5$

$(-4y - 4)/ (2y - 3) = 1/5$

By cross multiplication, we get

$5 \times (-4y - 4) = 1 \times (2y - 3)$

$20y – 20 = 2y – 3$

Transposing - 20 to RHS it becomes 20 and 6y to LHS it becomes -6y.

$20y – 2y = 20 – 3$

$22 y = 17$

y = 17/22

56. (x/5) = (x - 1)/6
Solution:-
We have,

(x/5) = (x - 1)/6
By cross multiplication, we get

6 × x = 5 × (x - 1)
6x = 5x - 5
Transposing 5x to RHS it becomes -5x

6x – 5x = -5
x = -5

57. 0.4(3x –1) = 0.5x + 1
Solution:-
We have,

0.4(3x –1) = 0.5x + 1
1.2x – 0.4 = 0.5x + 1
Transposing - 0.4 to RHS it becomes 0.4 and 0.5x to LHS it becomes -0.5x.

1.2x – 0.5x = 1 + 0.4
0.7x = 1.4
x = 1.4/0.7
x = 14/7
x = 2

58. 8x – 7 – 3x = 6x – 2x – 3
Solution:-
We have,

8x – 7 – 3x = 6x – 2x – 3
5x – 7 = 4x – 3
Transposing - 7 to RHS it becomes 7 and 4x to LHS it becomes -4x.

5x – 4x = 7 – 3
x = 4

59. 10x – 5 – 7x = 5x + 15 – 8
Solution:-
We have,

10x – 5 – 7x = 5x + 15 – 8

3x – 5 = 5x + 7

Transposing - 5 to RHS it becomes 5 and 5x to LHS it becomes -5x.

3x – 5x = 7 + 5

- 2x = 12

x = -12/2

x = - 6

60. 4t – 3 – (3t +1) = 5t – 4

Solution:-

We have,

4t – 3 – (3t +1) = 5t – 4

4t – 3 – 3t – 1 = 5t – 4

t – 4 = 5t – 4

Transposing t to RHS it becomes -t and -4 to LHS it becomes 4.

4 – 4 = 5t – t

0 = 4t

t = 0/4

t = 0

61. 5(x – 1) – 2(x + 8) = 0

Solution:-

We have,

5(x – 1) – 2(x + 8) = 0

5x – 5 – 2x – 16 = 0

3x – 21 = 0

Transposing -21 to RHS it becomes 21.

3x = 21

x = 21/3

x = 7