

EXERCISE

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

$$4x - x = 2 - 7$$

$$3x = -5$$

$$x = -5/3$$

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,

$$ax = -b$$

$$x = -b/a$$

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 $-17x$.

$$8x - 17x = 25 + 3$$

$$-9x = 28$$

$$x = -28/9$$

Therefore x is a rational number.

Solution:-

(a) positive

Let $a = 3$, $b = 4$

Then, $ax = b$

$$3x = 4$$

$$x = 4/3$$

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) $x^2 + 1$

(b) $y + y^2$

(c) 4

(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) $4/5$

(b) $1/15$

(c) 10

(d) 0

Solution:-

(b) $1/15$

Given,

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

$$S = 2/5 - 1/3$$

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

$$S = 1/15$$

12. $(-4/3)y = -3/4$, then $y =$

- (a) $-(3/4)^2$ (b) $-(4/3)^2$ (c) $(3/4)^2$ (d) $(4/3)^2$

Solution:-

(c) $(3/4)^2$

Given,

$$(-4/3)y = -3/4$$

$$Y = -3/4 \times -3/4$$

$$Y = 9/16$$

$$Y = (3 \times 3)/(4 \times 4)$$

$$Y = 3^2/4^2$$

$$Y = (3/4)^2$$

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,

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

$$21x + 21 = 357$$

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

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

$$x + 1 = 17$$

$$x = 17 - 1$$

$$x = 16$$

Therefore, the smallest multiple of 7 is,

$$7 \times 16 = 112.$$

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 highest power of the variable appearing in the equation is one.

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

Solution:-

The solution of the equation $3x - 4 = 1 - 2x$ is 1.

$$3x - 4 = 1 - 2$$

$$3x - 4 = -1$$

$$3x = -1 + 4$$

$$x = 3/3$$

$$x = 1$$

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

Solution:-

The solution of the equation $2y = 5y - 18/5$ is (6/5).

$$2y = 5y - (18/5)$$

$$\begin{aligned}(18/5) &= 5y - 2y \\ (18/5) &= 3y \\ y &= (18/5) \times (1/3) \\ y &= (6/5) \times (1/1) \\ y &= 6/5\end{aligned}$$

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. $9x - \underline{\hspace{2cm}} = -21$ has the solution (-2)

Solution:-

$9x - \underline{3} = -21$ has the solution (-2)

In the question it is given that, $x = -2$

Then, let us assume the missing number be y

$$\begin{aligned}(9 \times (-2)) - y &= -21 \\ -18 - y &= -21 \\ -y &= -21 + 18 \\ -y &= -3 \\ Y &= 3\end{aligned}$$

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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 $x + 8$

$$= 8.5 + 8$$

$$= \text{Rs } 16.5$$

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 sign.

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 10.

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 -60.

Given, $(x/5) + 30 = 18$

Transposing 30 to RHS and it becomes -30.

$$(x/5) = 18 - 30$$

$$(x/5) = -12$$

$$X = -12 \times 5$$

$$X = -60$$

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 -24 .

Let the number be x ,

Then,

$$x/8 = -3$$

$$x = -3 \times 8$$

$$x = -24$$

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 5.

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 $x =$ 7

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 $-(3/5)x$.

$$(2/5)x + (3/5)x = 5 + 2$$

$$(2x + 3x)/5 = 7$$

$$5x = 7 \times 5$$

$$X = 35/5$$

$$X = 7$$

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 6 years.

Let us assume swarnim's parent age be x year.

Then, after 18 year, Swarnim's age = $(x + 18)$ year

According to the question,

$$X + 18 = 4x$$

$$X - 4x = -18$$

$$-3x = -18$$

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

$$X = 6$$

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 $4x + 15 = 39$.

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 $x + 9$.

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)

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

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

\therefore 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 100.

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 $10x = 10 \times 10 = 100$

$$\begin{aligned} 10x + 10 &= (10 \times 10) + 10 \\ &= 110 \end{aligned}$$

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,

$$\text{Ten's digit} = 9 - x$$

So,

$$\begin{aligned}\text{The number} &= 10(9 - x) + x \\ &= 90 - 10x + x \\ &= 90 - 9x\end{aligned}$$

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,

$$\begin{aligned}\text{Before 5 years, Anju's mother age} &= 65 - y - 5 \\ &= (60 - y) \text{ years}\end{aligned}$$

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 $5x$ and the number of girls be $4x$.

From the question,

$$\begin{aligned}5x - 4x &= 9 \\ x &= 9\end{aligned}$$

\therefore Number of boys = $5x = 5 \times 9 = 45$ boys

Number of girls = $4x = 4 \times 9 = 36$ 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) $4x + 2 = 3$

$$4x = 3 - 2$$

$$X = \frac{1}{4}$$

(ii) $4x - 6 = -5$

$$4x = -5 + 6$$

$$X = \frac{1}{4}$$

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

$$2x + x = 4$$

$$3x = 4$$

$$X = \frac{3}{4}$$

42. If $(\frac{15}{8}) - 7x = 9$, then $-7x = 9 + (\frac{15}{8})$

Solution:-

False.

Given, $(\frac{15}{8}) - 7x = 9$

Transposing $\frac{15}{8}$ to RHS it becomes $-(\frac{15}{8})$

$$-7x = 9 - (\frac{15}{8})$$

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

$$6x \times 3 = 18 \times 3$$

$$18x = 54$$

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

Solution:-

False.

Given, $x/11 = 15$

Multiplying both LHS and RHS by 11, we get

$$(x/11) \times 11 = 15 \times 11$$

$$X = 165$$

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, $40 - x + 8 = 3(x + 8)$

$$48 - x = 3x + 24$$

$$-x - 3x = 24 - 48$$

$$-4x = -24$$

$$X = -24 \times (-1/4)$$

$$X = 6$$

\therefore 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,

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

By cross multiplication, we get

$$5x = 2 \times (2x - 1)$$

$$5x = 4x - 2$$

Transposing $4x$ to LHS it becomes $-4x$

$$5x - 4x = -2$$

$$x = -2$$

51. $((2x - 3)/(4x + 5)) = (1/3)$

Solution:-

We have,

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

By cross multiplication, we get

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

$$6x - 9 = 4x + 5$$

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

$$6x - 4x = 5 + 9$$

$$2x = 14$$

$$x = 14/2$$

$$x = 7$$

52. $(8/x) = (5/(x - 1))$

Solution:-

We have,

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

By cross multiplication, we get

$$8 \times (x - 1) = 5 \times x$$

$$8x - 8 = 5x$$

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

$$8x - 5x = 8$$

$$3x = 8$$

$$x = 8/3$$

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

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

$$5 - 5x + 3 + 3x = 8 - 16x$$

$$8 - 2x = 8 - 16x$$

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.

$$20y - 2y = 20 - 3$$

$$18y = 17$$

$$y = 17/22$$

56. $(x/5) = (x - 1)/6$

Solution:-

We have,

$$(x/5) = (x - 1)/6$$

By cross multiplication, we get

$$6 \times x = 5 \times (x - 1)$$

$$6x = 5x - 5$$

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.

$$3x = 21$$

$$x = 21/3$$

$$x = 7$$

