

Chapter - 4 Simple Equations

Exercise

In the Questions 1 to 18, there are four options out of which, one is correct. Choose the correct one.

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

- (a) a/b (b) $-b$ (c) $-b/a$ (d) b/a**

Solution:-

(c) $\frac{-b}{a}$

Taking,

$$ax + b = 0$$

$$ax = -b$$

$$x = \frac{-b}{a}$$

2. If a and b are positive integers, then the solution of the equation $ax = b$ will always be a

- (a) positive number (b) negative number (c) 1 (d) 0**

Solution:-

- (a) positive number

The solution of equation,

$$ax = b$$

$$x = \frac{b}{a}$$

3. Which of the following is not allowed in a given equation?

- (a) Adding the same number to both sides of the equation.
(b) Subtracting the same number from both sides of the equation.
(c) Multiplying both sides of the equation by the same non-zero number.
(d) Dividing both sides of the equation by the same number.**

Solution:-

- (d) Dividing both sides of the equation by the same number.

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

(a) $2x + 6 = 0$ (b) $3x - 5 = 0$ (c) $5x - 8 = x + 4$ (d) $4x + 7 = x + 2$

Solution:-

(d) $4x + 7 = x + 2$

Taking the equation,

$$4x + 7 = x + 2$$

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

$$3x = -5$$

$$x = \frac{-5}{3}$$

5. The equation which cannot be solved in integers is

(a) $5y - 3 = -18$ (b) $3x - 9 = 0$ (c) $3z + 8 = 3 + z$ (d) $9y + 8 = 4y - 7$

Solution:-

(c) $3z + 8 = 3 + z$

Taking,

$$3z + 8 = 3 + z$$

$$3z - z = 3 - 8$$

$$2z = 5$$

$$z = \frac{5}{2}$$

6. If $7x + 4 = 25$, then x is equal to

(a) $29/7$ (b) $100/7$ (c) 2 (d) 3

Solution:-

(d) 3

Considering the equation

$$7x + 4 = 25$$

$$7x = 25 - 4$$

$$7x = 21$$

$$x = \frac{21}{7}$$

$$x = 3$$

7. The solution of the equation $3x + 7 = -20$ is

(a) $17/7$ (b) -9 (c) 9 (d) $13/3$

Solution:-

(b) -9

Taking,

$$3x + 7 = -20$$

$$3x = -20 - 7$$

$$3x = -27$$

$$x = -9$$

8. The value of y for which the expressions $(y - 15)$ and $(2y + 1)$ become equal is

(a) 0 (b) 16 (c) 8 (d) -16

Solution:-

(d) -16

Taking,

$$(y - 15) = (2y + 1)$$

$$y - 2y = 15 + 1$$

$$-y = 16$$

$$y = -16$$

9. If $k + 7 = 16$, then the value of $8k - 72$ is

(a) 0 (b) 1 (c) 112 (d) 56

Solution:-

(a) 0

Taking,

$$k + 7 = 16$$

$$k = 16 - 7$$

$$k = 9$$

Then,

$$8k - 72 = (8 \times 9) - 72$$

$$= 72 - 72$$

$$= 0$$

10. If $43m = 0.086$, then the value of m is

(a) 0.002 (b) 0.02 (c) 0.2 (d) 2

Solution:-

(a) 0.002

Taking,

$$43m = 0.086$$

$$m = \frac{0.086}{43}$$

$$m = 0.002$$

11. x exceeds 3 by 7, can be represented as

(a) $x + 3 = 2$ (b) $x + 7 = 3$ (c) $x - 3 = 7$ (d) $x - 7 = 3$

Solution:-

(c) $x - 3 = 7$

12. The equation having 5 as a solution is:

(a) $4x + 1 = 2$ (b) $3 - x = 8$ (c) $x - 5 = 3$ (d) $3 + x = 8$

Solution:-

(d) $3 + x = 8$

Taking,

$$3 + x = 8.$$

$$x = 8 - 3$$

$$x = 5$$

13. The equation having - 3 as a solution is:

(a) $x + 3 = 1$ (b) $8 + 2x = 3$ (c) $10 + 3x = 1$ (d) $2x + 1 = 3$

Solution:-

(c) $10 + 3x = 1$

Consider the given equation,

$$10 + 3x = 1.$$

$$3x = 1 - 10$$

$$x = \frac{-9}{3}$$

$$x = -3$$

14. Which of the following equations can be formed starting with $x = 0$?

(a) $2x + 1 = -1$ (b) $x^2 + 5 = 7$ (c) $3x - 1 = -1$ (d) $3x - 1 = 1$

Solution:-

(c) $3x - 1 = -1$

Taking,

$$3x - 1 = -1.$$

$$3x = 1 + 1$$

$$x = \frac{0}{3}$$

$$x = 0$$

15. Which of the following equations cannot be formed using the equation $x = 7$?

(a) $2x + 1 = 15$ (b) $7x - 1 = 50$ (c) $x - 3 = 4$ (d) $7x - 1 = 0$

Solution:-

(b) $7x - 1 = 50$

Taking,

$$7x - 1 = 50.$$

$$7x = 50 + 1$$

$$7x = 49$$

$$x = 7$$

16. If $x/2 = 3$, then the value of $3x + 2$ is

(a) 20 (b) 11 (c) $13/2$ (d) 8

Solution:-

(a) 20

Consider the given equation,

$$\frac{x}{2} = 3 \text{ to find out the value of } x.$$

$$x = 3 \times 2$$

$$x = 6$$

So, the value of $3x + 2$ will be,

$$3x + 2 = (3 \times 6) + 2$$

$$= 18 + 2$$

$$= 20$$

17. Which of the following numbers satisfy the equation $-6 + x = -12$?

(a) 2 (b) 6 (c) -6 (d) -2

Solution:-

(c) -6

Consider the given equation,

$$-6 + x = -12.$$

$$-6 + (-6) = -12$$

$$-12 = -12$$

$$\text{LHS} = \text{RHS}$$

18. Shifting one term from one side of an equation to another side with a change of sign is known as

(a) commutativity (b) transposition (c) distributivity (d) associativity

Solution:-

(b) Transposition

In Questions 19 to 48, fill in the blanks to make the statements true.

19. The sum of two numbers is 60 and their difference is 30.

(a) If smaller number is x , the other number is _____. (use sum)

(b) The difference of numbers in term of x is _____ .

(c) The equation formed is _____ .

(d) The solution of the equation is _____ .

(e) The numbers are _____ and _____.

Solution:

Let smaller number be x .

So,

Other number would be $60 - x$.

According to question,

$$60 - x - x = 30$$

$$60 - 2x = 30$$

$$60 - 30 = 2x$$

$$30 = 2x$$

$$x = 15$$

Now,

$$60 - x = 60 - 15$$

$$= 45$$

Therefore,

- (a) $60 - x$
- (b) $60 - 2x$
- (c) $2x - 30$
- (d) -15
- (e) 15, 45

20. Sum of two numbers is 81. One is twice the other.

- (a) If smaller number is x , the other number is _____ .
- (b) The equation formed is _____ .
- (c) The solution of the equation is _____ .
- (d) The numbers are _____ and _____ .

Solution:

Let smaller number be x .

Other number would be $81 - x$ or $2x$

According to question,

$$2x = 81 - x$$

$$3x = 81$$

$$x = 27$$

Now,

$$2x = 2 \times 27$$

$$= 54$$

Therefore,

- (a) $81 - x$ or $2x$
- (b) $2x = 81 - x$
- (c) $x = 27$
- (d) 27, 54

21. In a test Abha gets twice the marks as that of Palak. Two times Abha's marks and three times Palak's marks make 280.

- (a) If Palak gets x marks, Abha gets _____ marks.
- (b) The equation formed is _____ .
- (c) The solution of the equation is _____ .
- (d) Marks obtained by Abha are _____ .

Solution:

Let Palak gets x marks.

Abha gets $2x$ marks.

According to question,

$$2(2x) + 3(x) = 280$$

$$4x + 3x = 280$$

$$7x = 280$$

$$x = 40$$

Now,

$$\begin{aligned} 2x &= 2 \times 40 \\ &= 80 \end{aligned}$$

Therefore,

- (a) $2x$
- (b) $4x + 3x = 280$
- (c) $x = 40$
- (d) 80

22. The length of a rectangle is two times its breadth. Its perimeter is 60 cm.

(a) If the breadth of rectangle is x cm, the length of the rectangle is _____.

(b) Perimeter in terms of x is _____.

(c) The equation formed is _____.

(d) The solution of the equation is _____.

Solution:

Let breadth of the rectangle be x cm.

Length of the rectangle would be $2x$ cm

$$\begin{aligned} \text{Perimeter of the rectangle} &= 2(2x + x) \\ &= 6x \end{aligned}$$

According to question,

$$6x = 60$$

$$x = \frac{60}{6}$$

$$x = 10$$

Now,

$$\begin{aligned} 2x &= 2 \times 10 \\ &= 20 \end{aligned}$$

Therefore,

- (a) $2x$
- (b) $2(2x + x)$ or $6x$
- (c) $6x = 60$
- (d) $x = 10$

23. In a bag there are 5 and 2 rupee coins. If they are equal in number and their worth is rupees 70, then

(a) The worth of x coins of rupees 5 each _____.

(b) The worth of x coins of rupees 2 each _____.

(c) The equation formed is _____.

(d) There are _____ 5 rupee coins and _____ 2 rupee coins.

Solution:

Let 2 rupee coins are x in numbers.

5 rupee coins also are x in numbers.

According to question,

$$2x + 5x = 70$$

$$7x = 70$$

$$x = 10$$

Therefore,

(a) $5x$

(b) $2x$

(c) $2x + 5x = 70$

(d) 10, 10

24. In a Mathematics quiz, 30 prizes consisting of 1st and 2nd prizes only are to be given. 1st and 2nd prizes are worth rupees 2000 and rupees 1000, respectively. If the total prize money is rupees 52,000 then show that:

(a) If 1st prizes are x in number the number of 2nd prizes are _____.

(b) The total value of prizes in terms of x are _____.

(c) The equation formed is _____.

(d) The solution of the equation is _____.

(e) The number of 1st prizes are _____ and the number of 2nd prizes are _____.

Solution:

Let 1st prizes are x in numbers.

So,

2nd prizes are $30 - x$ in numbers.

According to question,

$$2000(x) + 1000(30 - x) = 52000$$

$$2000x + 30000 - 1000x = 52000$$

$$1000x + 30000 = 52000$$

$$1000x = 52000 - 30000$$

$$1000x = 22000$$

$$x = 22$$

Now,

$$30 - x = 30 - 22$$

$$= 8.$$

Therefore,

(a) 30

(b) $2000x + 1000(30 - x)$

(c) $1000x + 30000 = 52000$

(d) $x = 22$

(e) 22, 8

25. If $z + 3 = 5$, then $z =$ _____.

Solution:-

Taking,

$$z + 3 = 5$$

$$z = 5 - 3$$

$$\underline{z = 2}$$

26. _____ is the solution of the equation $3x - 2 = 7$.

Solution:-

Taking,

$$3x - 2 = 7$$

$$3x = 7 + 2$$

$$3x = 9$$

$$x = 3$$

$x = 3$ is the solution of the equation $3x - 2 = 7$.

27. _____ is the solution of $3x + 10 = 7$.

Solution:-

Consider the given equation,

$$3x + 10 = 7$$

$$3x = 7 - 10$$

$$3x = -3$$

$$x = -1$$

$x = -1$ is the solution of the equation $3x + 10 = 7$.

28. If $2x + 3 = 5$, then value of $3x + 2$ is _____.

Solution:-

Consider the given equation,

$$2x + 3 = 5$$

$$2x = 5 - 3$$

$$2x = 2$$

$$x = 1$$

Now,

$$3x + 2 = (3 \times 1) + 2$$

$$3x + 2 = 3 + 2$$

$$\underline{3x + 2 = 5}$$

29. In integers, $4x - 1 = 8$ has _____ solution.

Solution:-

Taking,

$$4x - 1 = 8$$

$$4x = 8 + 1$$

$$4x = 9$$

$$x = \frac{9}{4}$$

In integers,

$4x - 1 = 8$ has no solution.

30. In natural numbers, $4x + 5 = -7$ has _____ solution.

Solution:-

Consider the given integers,

$$4x + 5 = -7$$

$$4x = -7 - 5$$

$$4x = -13$$

$$x = \frac{-13}{4}$$

In natural numbers,

$4x + 5 = -7$ has no solution.

31. In natural numbers, $x - 5 = -5$ has _____ solution.

Solution:-

Taking,

$$x - 5 = -5$$

$$x = -5 + 5$$

$$x = 0$$

In natural numbers,
 $x - 5 = -5$ has no solution.

32. In whole numbers, $x + 8 = 12 - 4$ _____ has solution.

Solution:-

Taking,
 $x + 8 = 12 - 4$.
 $x + 8 = 8$
 $x = 8 - 8$
 $x = 0$

In natural numbers,
 $x + 8 = 12 - 4$ has no solution.

33. If 5 is added to three times a number, it becomes the same as 7 is subtracted from four times the same number. This fact can be represented as _____.

Solution:-

Let us assume the number be x ,

Given,
If 5 is added to three times a number $= 3x + 5$
7 is subtracted from four times the same number $= 4x - 7$

If 5 is added to three times a number, it becomes the same as 7 is subtracted from four times the same number.

This fact can be represented as,
 $3x + 5 = 4x - 7$.

34. $x + 7 = 10$ has the solution _____ .

Solution:-

Taking,,
 $x + 7 = 10$.
 $x = 10 - 7$
 $x = 3$

35. $x - 0 =$ _____ ; when $3x = 12$.

Solution:-

Taking,
 $3x = 12$
 $x = 4$
 So,
 $x - 0 = 4 - 0$
 $x - 0 = 4$

36. $x - 1 =$ _____ ; when $2x = 2$.

Solution:-

Taking,
 $2x = 2$
 $x = 1$
 So,
 $x - 1 = 1 - 1$
 $x - 1 = 0$

37. $x -$ _____ = 15; when $x/2 = 6$.

Solution:-

Taking,
 $\frac{x}{2} = 6$
 $x = 6 \times 2$
 $x = 12$
 So,
 $12 - (-3)$
 $12 + 3 = 15$
 = RHS
 Hence,
 $x - (-3) = 15$

38. The solution of the equation $x + 15 = 19$ is _____.

Solution:-

Taking,
 $x + 15 = 19$
 $x = 19 - 15$
 $x = 4$

39. Finding the value of a variable in a linear equation that _____ the equation is called a _____ of the equation.

Solution:-

Finding the value of a variable in a linear equation that satisfies the equation is called a root of the equation.

40. Any term of an equation may be transposed from one side of the equation to the other side of the equation by changing the _____ of the term.

Solution:-

Any term of an equation may be transposed from one side of the equation to the other side of the equation by changing the sign of the term.

41. If $(9/5)x = 18/5$, then $x =$ _____.

Solution:-

Taking,

$$\frac{9}{5}x = \frac{18}{5}$$

$$x = \frac{18 \times 5}{5 \times 9}$$

$$x = 2$$

Then, the value of $x = 2$

42. If $3 - x = -4$, then $x =$ _____.

Solution:-

Taking,

$$3 + 4 = x$$

$$x = 7$$

Then, the value of $x = 7$

43. If $x - 1/2 = -1/2$, then $x =$ _____.

Solution:-

Consider the given equation,

$$x - \frac{1}{2} = -\frac{1}{2}$$

$$x = -\frac{1}{2} + \frac{1}{2}$$

$$x = 0$$

Then, the value of $x = 0$

44. If $\frac{1}{6} - x = \frac{1}{6}$ then $x =$ _____.

Solution:-

Taking,

$$\frac{1}{6} - x = \frac{1}{6}$$

$$x = \frac{1}{6} - \frac{1}{6}$$

$$x = 0$$

Then, the value of $x = 0$

45. If 10 less than a number is 65, then the number is _____.

Solution:-

10 less than a number,

$$65 = x - 10$$

Then, the number,

$$x - 10 = 65$$

$$x = 65 + 10$$

$$\underline{x = 75}$$

46. If a number is increased by 20, it becomes 45. Then the number is _____.

Solution:-

Let us assume the number be x .

If a number is increased by 20 $= x + 20$

If a number is increased by 20, it becomes 45,

$$x + 20 = 45$$

$$x = 45 - 20$$

$$\underline{x = 25}$$

47. If 84 exceeds another number by 12, then the other number is _____.

Solution:-

Let us assume the number be x .

If a number is increased by 12 $= x + 12$

If a number is increased by 12, it becomes 84,

$$x + 12 = 84$$

$$x = 84 - 12$$

$$\underline{x = 72}$$

48. If $x - (7/8) = 7/8$, then $x =$ _____.

Solution:-

Taking,

$$x - \frac{7}{8} = \frac{7}{8}$$

So,

$$x = \frac{7}{8} + \frac{7}{8}$$

$$x = \frac{14}{8}$$

$$x = \frac{7}{4}$$

In Questions 49 to 55, state whether the statements are True or False.

49. 5 is the solution of the equation $3x + 2 = 17$.

Solution:-

True.

Taking,

$$3x + 2 = 17$$

$$3x = 17 - 2$$

$$3x = 15$$

$$x = 5$$

50. $9/5$ is the solution of the equation $4x - 1 = 8$.

Solution:-

False.

Consider the equation,

$$4x - 1 = 8$$

$$4x = 8 + 1$$

$$4x = 9$$

$$x = \frac{9}{4}$$

51. $4x - 5 = 7$ does not have an integer as its solution.

Solution:-

False.

Taking,

$$4x - 5 = 7$$

$$4x = 7 + 5$$

$$4x = 12$$

$$x = \frac{12}{4}$$

$$x = 3$$

So, the solution has integer in its solution.

52. One third of a number added to itself gives 10, can be represented as $x/3 + 10 = x$.

Solution:-

False.

One third of a number added to itself = $\frac{x}{3} + x$

One third of a number added to itself gives 10, can be represented as $\frac{x}{3} + x = 10$

53. $3/2$ is the solution of the equation $8x - 5 = 7$.

Solution:-

True.

Consider the equation,

$$8x - 5 = 7$$

$$8x = 7 + 5$$

$$8x = 12$$

$$x = \frac{12}{8}$$

$$x = \frac{3}{2}$$

54. If $4x - 7 = 11$, then $x = 4$.

Solution:-

False.

Consider the equation,

$$4x - 7 = 11$$

$$4x = 11 + 7$$

$$4x = 18$$

$$x = \frac{18}{4}$$

$$x = \frac{9}{2}$$

55. If 9 is the solution of variable x in the equation $(5x - 7)/2 = y$, then the value of y is 28.

Solution:-

False.

Consider the equation,

$$\frac{5x - 7}{2} = y$$

Also, it is given that the value of $x = 9$

So,

$$\frac{5x - 7}{2} = y$$

$$\frac{5 \times 9 - 7}{2} = y$$

$$\frac{45 - 7}{2} = y$$

$$19 = y$$

56. Match each of the entries in Column I with the appropriate entries in Column II.

Column I	Column II
(i) $x + 5 = 9$	(A) $-(5/3)$

(ii) $X - 7 = 4$	(B) $5/3$
(iii) $x/12 = -5$	(C) 4
(iv) $5x = 30$	(D) 6
(v) The value of y which satisfies $3y = 5$	(E) 11
(vi) If $p = 2$, then the value of $1/3 (1 - 3p)$	(F) -60
	(G) 3

Solution:

- (i) - (C)
- (ii) - (E)
- (iii) - (F)
- (iv) - (D)
- (v) - (B)
- (vi) - (A)

In Questions 57 to 67, express each of the given statements as an equation.

57. 13 subtracted from twice of a number gives 3 .

Solution:

Let the number be x.

So, twice of number = $2x$

On subtracting 13 from it, we get $2x - 13$

Therefore,

$2x - 13 = 3$ is the required equation.

58. One-fifth of a number is 5 less than that number.

Solution:

Let the number be x.

So, one-fifth of number = $\frac{x}{5}$

Therefore,

$\frac{x}{5} = x - 5$ is the required equation.

59. A number is 7 more than one-third of itself.

Solution:

Let the number be x.

So, one-third of number = $\frac{x}{3}$

7 more than $\frac{x}{3} = \frac{x}{3} + 7$

Therefore,

$x = \frac{x}{3} + 7$ is the required equation

60. Six times a number is 10 more than the number.

Solution:

Let the number be x.

So,

six times of the number = $6x$

Therefore,

$6x - x + 10$ is the required equation.

61. If 10 is subtracted from half of a number, the result is 4.

Solution:

Let the number be x.

So, half of the number = $\frac{x}{2}$

On subtracting 10 from it, we get,

$\frac{x}{2} - 10$

Therefore,

$\frac{x}{2} - 10 = 4$ is the required equation.

62. Subtracting 5 from p, the result is 2.

Solution:

The number is p .

On subtracting 5 from it, we get

$$p - 5$$

Therefore,

$p - 5 = 2$ is the required equation.

63. Five times a number increased by 7 is 27.

Solution:

Let the number be x .

So,

five times of the number = $5x$

When increased by 7, it gives $5x + 7$

Hence,

$5x + 7 = 27$ is the required equation.

64. Mohan is 3 years older than Sohan. The sum of their ages is 43 years.

Solution:

Let Sohan is x years old.

So,

Mohan is $x + 3$ years old.

Sum of their ages be $x + (x + 3)$.

Therefore,

$x + (x + 3) = 43$ is the required equation.

65. If 1 is subtracted from a number and the difference is multiplied by $\frac{1}{2}$, the result is 7.

Solution:

Let the number be x .

On subtracting 1 from it, we get $x - 1$

Multiplying it by $\frac{1}{2}$ we get,

$$\frac{1}{2}(x - 1)$$

Therefore,

$$\frac{1}{2}(x-1) = 7$$

66. A number divided by 2 and then increased by 5 is 9.

Solution:

Let the number be x .

Dividing the number by 2, we get $\frac{x}{2}$

When, increased by 5, it gives the expression

$$\frac{x}{2} + 5$$

Now,

$$\frac{x}{2} + 5 = 9 \text{ is the required equation.}$$

67. The sum of twice a number and 4 is 18.

Solution:

Let the number be x .

So, twice of the number = $2x$

On adding 4 to it, we get

$$2x + 4$$

So,

$$2x + 4 = 18 \text{ is the required equation.}$$

68. The age of Sohan Lal is four times that of his son Amit. If the difference of their ages is 27 years, find the age of Amit.

Solution:

Let the age of Amit be x years.

So, age of Sohan Lal = $4x$ years

According to question,

$$4x - x = 27$$

$$3x = 27$$

$$x = 9$$

Hence, Amit is 9 years old.

69. A number exceeds the other number by 12. If their sum is 72, find the numbers.

Solution:

Let the number be x .

Other number = $x + 12$

According to question,

$$x + x + 12 = 72$$

$$2x + 12 = 72$$

$$2x = 72 - 12$$

$$= 60$$

$$x = 30$$

Now,

$$x + 12 = 30 + 12$$

$$= 42$$

Hence, the numbers are 30 and 42

70. Seven times a number is 12 less than thirteen times the same number. Find the number.

Solution:

Let the number be x .

So, seven times of the number = $7x$

Thirteen times of the number = $13x$

According to question,

$$7x = 13x - 12$$

$$12 = 13x - 7x$$

$$6x = 12$$

$$x = 2$$

71. The interest received by Karim is rupees 30 more than that of Ramesh. If the total interest received by them is rupees 70, find the interest received by Ramesh.

Solution:

Let the interest received by Ramesh be x .

So, interest received by Karim = ₹ $(30 + x)$

According to question,

$$\begin{aligned}
 x + x + 30 &= 70 \\
 2x &= 70 - 30 \\
 x &= 20
 \end{aligned}$$

Hence, ₹ 20 is the interest received by Ramesh

72. Subramaniam and Naidu donate some money is a Relief Fund. The amount paid by Naidu is rupees 125 more than that of Subramaniam. If the total money paid by them is rupees 975, find the amount of money donated by Subramaniam.

Solution:

Let the amount of money donated by Subramaniam be x .
 So, the amount paid by Naidu is $= (x + 125)$

$$\begin{aligned}
 &\text{According to question,} \\
 x + x + 125 &= 975 \\
 2x &= 975 - 125 \\
 &= 850 \\
 x &= 425
 \end{aligned}$$

Hence, ₹425 is donated by Subramaniam.

73. In a school, the number of girls is 50 more than the number of boys. The total number of students is 1070. Find the number of girls.

Solution:

Let the number of girls be x .
 So, the number of boys $= x - 50$

$$\begin{aligned}
 &\text{According to question,} \\
 x + x - 50 &= 1070 \\
 2x &= 1070 + 50 \\
 &= 1120 \\
 x &= 560
 \end{aligned}$$

74. Two times a number increased by 5 equals 9. Find the number.

Solution:

Let the number be x .
 So, two times of the number $= 2x$

When, increased by 5, it gives the expression $2x + 5$

$$2x + 5 = 9$$

$$2x = 9 - 5$$

$$= 4$$

$$x = 2$$

75. 9 added to twice a number gives 13. Find the number.

Solution:

Let the number be x .

So, twice of the number = $2x$

On adding 9 to it, we get $2x + 9$

$$2x + 9 = 13$$

$$2x = 13 - 9$$

$$= 4$$

$$x = 2$$

Hence,

$x = 2$ is the required number.

76. 1 subtracted from one-third of a number gives 1. Find the number.

Solution:

Let the number be x .

So, one third of the number = $\frac{x}{3}$

On subtracting 1 from it, we get $\frac{x}{3} - 1$

$$\frac{x}{3} - 1 = 1$$

$$\frac{x}{3} = 1 + 1$$

$$= 2$$

$$x = 3 \times 2$$

$$x = 6$$

Hence,

$x = 6$ is the required number.

77. After 25 years, Rama will be 5 times as old as he is now. Find his present age.

Solution:

Let present age of Rama be x years.

So,

five times of his age = $5x$.

According to question,

$$5x = x + 25$$

$$5x - x = 25$$

$$4x = 25$$

$$x = \frac{25}{4}$$

$$x = 6\frac{1}{4}$$

78. After 20 years, Manoj will be 5 times as old as he is now. Find his present age.

Solution:

Let present age of Manoj be x years.

So, five times of his age = $5x$

According to question,

$$5 = x + 20$$

$$5x - x = 20$$

$$4x = 20$$

$$x = 5$$

At present Manoj is 5 years old.

79. My younger sister's age today is 3 times, what it will be 3 years from now minus 3 times what her age was 3 years ago. Find her present age.

Solution:

Let present age of my younger sister be x years.

After 3 years, her age will be = $(x + 3)$ years

Before 3 years, her age was = $(x - 3)$ years

According to question,

$$x = 3(x + 3) - 3(x - 3)$$

$$x = 3(x + 3 - x + 3)$$

$$x = 3(6)$$

$$= 18$$

80. If 45 is added to half a number, the result is triple the number. Find the number.

Solution:

Let the number be x .

So, half of the number = $\frac{x}{2}$

On adding 45 to it, we get $\frac{x}{2} + 45$

$$45 + \frac{x}{2} = 3x$$

$$45 = 3x - \frac{x}{2}$$

$$45 = \frac{6x - x}{2}$$

$$45 = \frac{5x}{2}$$

$$90 = 5x$$

$$x = 18$$

81. In a family, the consumption of wheat is 4 times that of rice. The total consumption of the two cereals is 80 kg. Find the quantities of rice and wheat consumed in the family.

Solution:

Let the quantity of rice consumed in the family be x kg.

So, quantity of wheat consumed = $4x$ kg

According to question,

$$x + 4x = 80$$

$$5x = 80$$

$$x = 16$$

Hence, 16 kg rice consumed in the family and $4 \times 16 = 64$ kg wheat consumed in the family.

82. In a bag, the number of one rupee coins is three times the number of two rupees coins. If the worth of the coins is rupees 120, find the number of 1 rupee coins.

Solution:

Let two rupees coins are x in numbers.

So, one rupee coins are $3x$ in numbers.

According to question,

$$1(3x) + 2(x) = 120$$

$$3x + 2x = 120$$

$$5x = 120$$

$$x = 24$$

Hence,

$3 \times 24 = 72$ coins are of one rupee coins.

83. Anamika thought of a number. She multiplied it by 2, added 5 to the product and obtained 17 as the result. What is the number she had thought of?

Solution:

Let the number Anamika thought be x .

Multiplying it by 2, we get $2x$

On adding 5 to it, we get $2x + 5$

$$2x + 5 = 17$$

$$2x = 17 - 5$$

$$= 12$$

$$x = 6$$

Hence, she had thought of number 6.

84. One of the two numbers is twice the other. The sum of the numbers is 12. Find the numbers.

Solution:

Let the one number be x .

So, other number = $2x$

According to question,

$$x + 2x = 12$$

$$3x = 12$$

$$x = 4$$

$$\begin{aligned}\text{Other number is } 2x &= 2 \times 4 \\ &= 8\end{aligned}$$

85. The sum of three consecutive integers is 5 more than the smallest of the integers. Find the integers.

Solution:

Let the smallest integer be x

So, next two consecutive integer would be $x + 1$ and $x + 2$ respectively.

According to question,

$$x + x + 1 + x + 2 = x + 5$$

$$3x + 3 = x + 5$$

$$3x - x = 5 - 3$$

$$2x - 2$$

$$x = 1$$

Hence, next two consecutive integers are 2 and 3 respectively.

86. A number when divided by 6 gives the quotient 6. What is the number?

Solution:

Let the number be x .

Dividing it by 6, we get $\frac{x}{6}$.

So,

$$\frac{x}{6} = 6$$

$$x = 6$$

Hence,

$x = 36$ is the required number.

87. The perimeter of a rectangle is 40m. The length of the rectangle is 4 m less than 5 times its breadth. Find the length of the rectangle.

Solution:

Let the breadth of rectangle be x m.

So, five times of breadth = $5x$

and,

length of rectangle = $(5x - 4)$ m

Perimeter of rectangle = 40 m

$$2(x + 5x - 4) = 40$$

$$2(6x - 4) = 40$$

$$6x - 4 = 20$$

$$6x = 20 + 4$$

$$= 24$$

$$x = 4$$

So, length of rectangle = $(5 \times 4 - 4)$
= 16 m

88. Each of the 2 equal sides of an isosceles triangle is twice as large as the third side. If the perimeter of the triangle is 30 cm, find the length of each side of the triangle.

Solution:

Let length of equal sides of an isosceles triangle be $2x$ cm.
So, the third side of triangle x cm

Perimeter of triangle = 30 cm

$$x + 2x + 2x = 30$$

$$5x = 30$$

$$x = 6$$

Hence, 6 cm, 12 cm and 12 cm are the required sides of the triangle.

89. The sum of two consecutive multiples of 2 is 18. Find the numbers.

Solution:

Let first multiple of 2 be x .
So, next multiple of 2 = $x + 2$

According to question,

$$x + x + 2 = 18$$

$$2x = 18 - 2$$

$$= 16$$

$$x = 8$$

Hence, 8 and 10 are required numbers.

90. Two complementary angles differ by 20° . Find the angles.

Solution:

Let one angle be x .

So, complement of $x = 90^\circ - x$

According to question,

$$x - (90^\circ - x) = 20^\circ$$

$$x - 90^\circ + x = 20^\circ$$

$$2x = 20^\circ + 90^\circ$$

$$= 110^\circ$$

$$x = 55^\circ$$

Therefore,

$$\begin{aligned}\text{Complement of } x &= 90^\circ - x \\ &= 90^\circ - 55^\circ \\ &= 35^\circ\end{aligned}$$

91. 150 has been divided into two parts such that twice the first part is equal to the second part. Find the parts.

Solution:

Let first part be x

So, other part = $150 - x$

According to question,

$$2x = 150 - x$$

$$2x + x = 150$$

$$3x = 150$$

$$x = 50$$

$$\begin{aligned}\text{So, other part} &= 150 - x \\ &= 150 - 50 \\ &= 100\end{aligned}$$

92. In a class of 60 students, the number of girls is one third the number of boys. Find the number of girls and boys in the class.

Solution:

Let the number of boys in class = x

So, the number of girls in class = $60 - x$

According to question,

$$60 - x = \frac{x}{3}$$

$$180 - 3x = x$$

$$180 = 3x + x$$

$$4x = 180$$

$$x = 45$$

Hence,

Number of boys in the class = 45

$$\begin{aligned}\text{And number of girls in the class} &= 60 - 45 \\ &= 15\end{aligned}$$

93. Two-third of a number is greater than one-third of the number by 3. Find the number.

Solution:

Let the number be x.

So, two-third of numbers = $\frac{2}{3}x$

According to question,

$$\frac{2}{3}x = \frac{1}{3}x + 3$$

$$\frac{2}{3}x - \frac{1}{3}x = 3$$

$$\frac{1}{3}x = 3$$

$$x = 9$$

94. A number is as much greater than 27 as it is less than 73. Find the number.

Solution:

Let the number be x.

According to question,

$$x - 27 = 73 - x$$

$$x + x = 73 + 27$$

$$2x = 100$$

$$x = 50$$

95. A man travelled two fifth of his journey by train, one-third by bus, one-fourth by car and the remaining 3 km on foot. What is the length of his total journey?

Solution:

Let the length of total journey be x km.

Journey by train = $\frac{2}{5}x$ km

Journey by bus = $\frac{1}{3}x$ km

Journey by car = $\frac{1}{4}x$ km

And journey on foot = $\frac{1}{4}x$ km

$$x = \frac{2}{5}x + \frac{1}{3}x + \frac{1}{4}x + 3$$

$$x - \frac{2}{5}x - \frac{1}{3}x - \frac{1}{4}x = 3$$

$$\frac{60x - 24x - 20x - 15x}{60} = 3$$

$$\frac{x}{60} = 3$$

$$x = 180$$

Hence,

$x = 180$ km is the length of total journey.

96. Twice a number added to half of itself equals 24. Find the number.

Solution:

Let the number be x .

According to question,

$$2x + \frac{1}{2}x = 24$$

$$\frac{4x + x}{2} = 24$$

$$5x = 48$$

$$x = \frac{48}{5}$$

$$x = 9.6$$

Hence, $x = 9.6$ is the required number.

97. Thrice a number decreased by 5 exceeds twice the number by 1. Find the number.

Solution:

Let the number be x .

So, thrice of the number = $3x$

When it decreased by 5, we get,

$$3x - 5$$

According to question,

$$3x - 5 = 2x + 1$$

$$3x - 2x = 1 + 5$$

$$x = 6$$

Hence,

$x = 6$ is the required number.

98. A girl is 28 years younger than her father. The sum of their ages is 50 years. Find the ages of the girl and her father.

Solution:

Let the age of father be x years.

So, age of his girl = $(x - 28)$ years

According to question,

$$x + x - 28 = 50$$

$$2x = 50 + 28 = 78$$

$$x = 39$$

Hence, age of father = 39 years

Age of his girl = 11 years

99. The length of a rectangle is two times its width. The perimeter of the rectangle is 180 cm. Find the dimensions of the rectangle.

Solution:

Let the width of rectangle be x cm.

So, the length of rectangle = $2x$

Perimeter of rectangle = 180 cm

$$2(2x + x) = 180$$

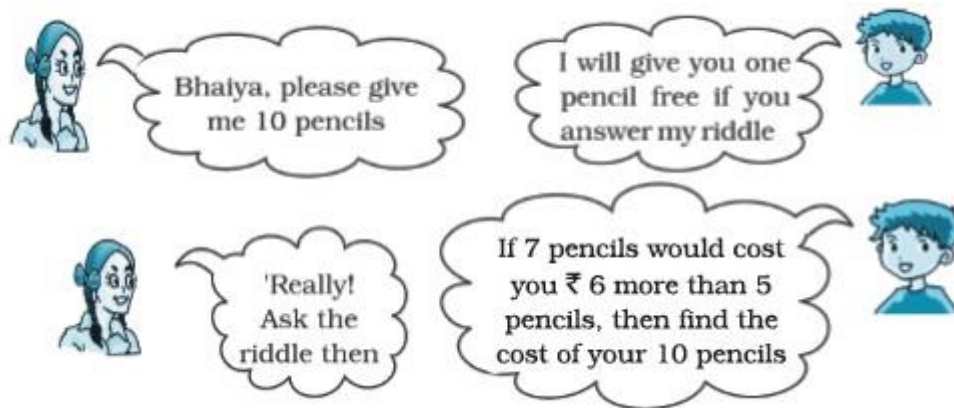
$$3x = 90$$

$$x = 30$$

Hence, width of rectangle = 30 cm

And length of rectangle = 2×30
= 60 cm

100. Look at this riddle? If she answers the riddle correctly however will she pay for the pencils?



Solution:

Let the cost of one pencil be ₹ x

So, the cost of 5 pencils = ₹ $5x$

Cost of 7 pencils = ₹ $7x$

According to question,

$$7x = 5x + 6$$

$$7x - 5x = 6$$

$$2x = 6$$

$$x = 3$$

$$\begin{aligned} \text{Cost of 10 pencils} &= ₹ (3 \times 10) \\ &= ₹ 30 \end{aligned}$$

101. In a certain examination, a total of 3768 students secured first division in the years 2006 and 2007. The number of first division in 2007 exceeded those in 2006 by 34. How many students got first division in 2006?

Solution:

Let number of students got first division in 2006 be x .

So, the number of students got first division in 2007 = $3768 - x$.

According to question,

$$3768 - x = x + 34$$

$$3768 - 34 = x + x$$

$$2x = 3734$$

$$x = 1867$$

Hence, 1867 students got first division in 2006

102. Radha got rupees 17,480 as her monthly salary and over-time. Her salary exceeds the over-time by rupees 10,000. What is her monthly salary?

Solution:

Let Radha's monthly salary = ₹ x
 So, money got by her in overtime = ₹ (17480 – x)

According to question,
 $x = 17480 - x + 10000$
 $x + x = 17480 + 10000$
 $2x = 27480$
 $x = 13740$

Hence, 13740 is her monthly salary.

103. If one side of a square is represented by $18x - 20$ and the adjacent side is represented by $42 - 13x$, find the length of the side of the square.

Solution:

As, square has all sides equal

$$18x - 20 = 42 - 13x$$

$$18x + 13x = 42 + 20$$

$$31x = 62$$

$$x = 2$$

$$\begin{aligned} \text{Side of square} &= 18 \times 2 - 20 \\ &= 36 - 20 \\ &= 16 \end{aligned}$$

So, length of the side of the square is 16 units.

104. Follow the directions and correct the given incorrect equation, written in Roman numerals:

(a) Remove two of these matchsticks to make a valid equation:

$$IX - VI = V$$

(b) Move one matchstick to make the equation valid. Find two different solutions.

$$VI - IV = XI$$

Solution:

(a) Incorrect equation =

After removing two matchsticks the correct equation =

(b) Incorrect equation =

$$VI + IV = XI$$

After removing one matchstick the correct equation =

$$VI + IV = X \quad \text{or} \quad VI + V = XI$$

105. What does a duck do when it flies upside down? The answer to this riddle is hidden in the equation given below:

If $i + 69 = 70$, then $i = ?$ If $8u = 6u + 8$, then $u = ?$

If $4a = -5a + 45$, then $a = ?$ if $4q + 5 = 17$, then $q = ?$

If $-5t - 60 = -70$, then $t = ?$ If $14s + 98 = 100$, then $s = ?$

If $\frac{5}{3}p + 9 = 24$, then $p = \underline{\hspace{2cm}}$?

If $3c = c + 12$, then $c = \underline{\hspace{2cm}}$?

If $3(k + 1) = 24$, then $k = \underline{\hspace{2cm}}$?

For riddle answer: substitute the number for the letter it equals

$$\frac{\text{---}}{1} \quad \frac{\text{---}}{2} \quad \frac{\text{---}}{3} \quad \frac{\text{---}}{4} \quad \frac{\text{---}}{5} \quad \frac{\text{---}}{6} \quad \frac{\text{---}}{7} \quad \frac{\text{---}}{8} \quad \frac{\text{---}}{4} \quad \frac{\text{---}}{9}$$

Solution:

$$\begin{aligned} i + 69 &= 70 \\ i &= 70 - 69 \\ &= 1 \end{aligned}$$

$$\begin{aligned} 8u &= 6u + 8 \\ 8u - 6u &= 8 \\ 2u &= 8 \\ u &= 4 \end{aligned}$$

$$\begin{aligned} 4a &= -5a + 45 \\ 4a + 5a &= 45 \\ 9a &= 45 \\ a &= 5 \end{aligned}$$

$$\begin{aligned} 4q + 5 &= 17 \\ 4q &= 17 - 5 \\ 4q &= 12 \\ q &= 3 \end{aligned}$$

$$-5t - 60 = -70$$

$$-5t = -70 + 60$$

$$-5t = -10$$

$$t = 2$$

$$\frac{1}{4}s + 98 = 100$$

$$\frac{1}{4}s = 100 - 98$$

$$s = 8$$

$$\frac{5}{3}p + 9 = 24$$

$$\frac{5}{3}p = 24 - 9$$

$$p = 9$$

$$3c = c + 12$$

$$c = 6$$

$$3(k + 1) = 24$$

$$k = 7$$

Therefore,

$$1 = i,$$

$$2 = t,$$

$$3 = q,$$

$$4 = u,$$

$$5 = a,$$

$$6 = c,$$

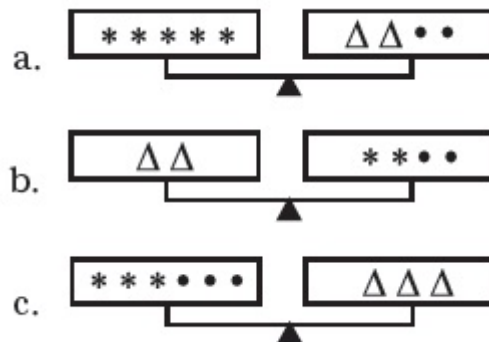
$$7 = k,$$

$$8 = s,$$

$$9 = p$$

Substituting the letter for corresponding number in equation, we get 'it quacks up'.

106. The three scales below are perfectly balanced if $\bullet = 3$. What are the values of Δ and $*$?



Solution:

We have,

$$\bullet = 3$$

Also,

$$(a) 5* = 2\Delta + 2\bullet$$

$$(b) 2\Delta = 2* + 2\bullet$$

$$(c) 3* = 3\bullet + 3\Delta$$

Putting value of (b) in (a),

$$5* = 2* + 2\bullet + 2\bullet$$

$$5* - 2* = 4\bullet$$

$$3* = 4 \times 3$$

$$* = \frac{4 \times 3}{3}$$

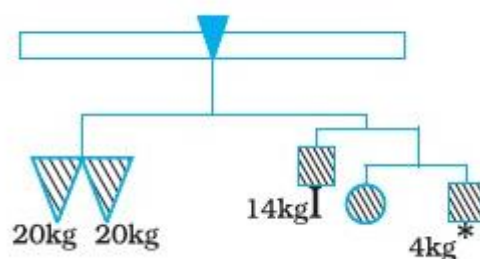
$$* = 4$$

Putting values in (b),

$$2\Delta = 2 \times 4 + 2 \times 3$$

$$\Delta = 7$$

107. The given figure represents a weighing balance. The weights of some objects in the balance are given. Find the weight of each square and the circle.



Solution:

According to question, we have,

$$\begin{aligned} & \textcircled{\text{■}} = * + \text{■} \\ \Rightarrow & \textcircled{\text{■}} = 4 + \text{■} \quad \dots(i) \\ \text{and } \nabla + \nabla &= \text{■} + \text{I} + \textcircled{\text{■}} + \text{■} + * \\ \Rightarrow & 20 + 20 = 2\text{■} + 14 + \textcircled{\text{■}} + 4 \\ \Rightarrow & 40 = 2\text{■} + 18 + 4 + \text{■} \quad (\text{Using (i)}) \\ \Rightarrow & 40 = 3\text{■} + 22 \\ \Rightarrow & 3\text{■} = 40 - 22 \\ \Rightarrow & 3\text{■} = 18 \\ \Rightarrow & \text{■} = 6 \text{ kg} \\ \text{From eq (i), } \textcircled{\text{■}} &= (4 + 6) \text{ kg} = 10 \text{ kg} \end{aligned}$$