

MATHEMATICS

Chapter 4: Simple Equations



Multiple Choice Questions :

Question 1. Write the statements “Seven times a number plus 7 gets you 77” in the form of equations:

- (a) $7x + 7 = 77$
- (b) $7x - 7 = 77$
- (c) $7x + 6 = 66$
- (d) None of these

Question 2. Solve the given equation : $3n - 2 = 46$.

- (a) 16
- (b) 12
- (c) 14
- (d) None of these

Question 3. Which is a solution of the equation $4x - 3 = 13$?

- (a) $x = 5$
- (b) $x = 3$
- (c) $x = 4$
- (d) None of these

Question 4. Write an equation for If you take away 6 from 6 times y you get 60.

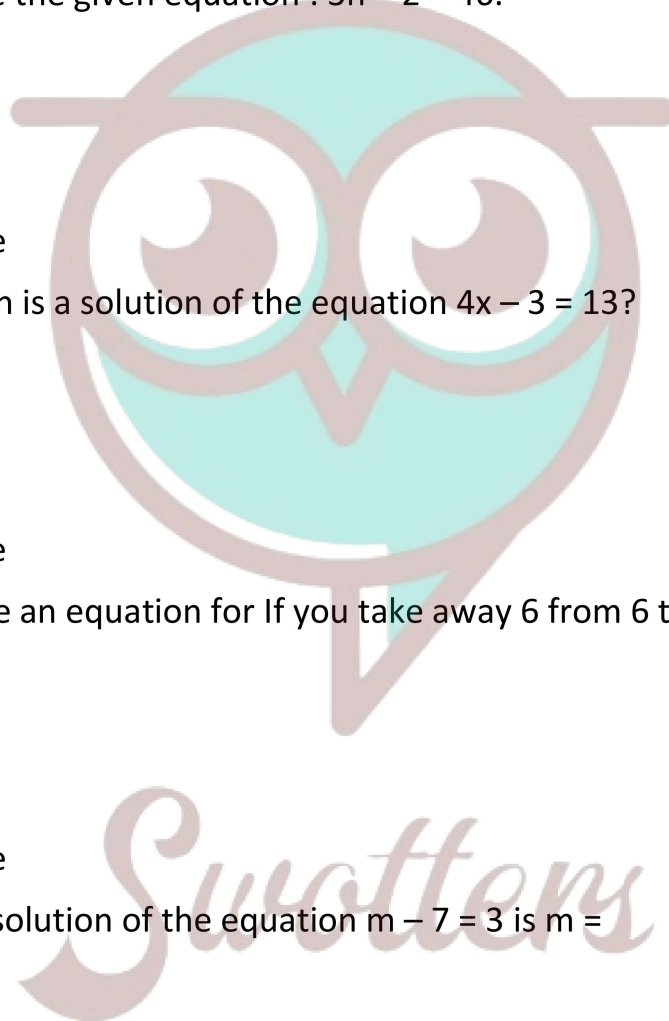
- (a) $6y - 6 = 60$
- (b) $6y + 6 = 60$
- (c) $6y \div 6 = 60$
- (d) None of these

Question 5. The solution of the equation $m - 7 = 3$ is $m =$

- (a) 15
- (b) 12
- (c) 10
- (d) None of these

Question 6. Solve the given equation : $x + 6 = 2$.

- (a) 4
- (b) 6
- (c) -4
- (d) None of these



Question 7. By solving the equation $2a - 2 = 20$, the value of 'a' will be

- (a) 12
- (b) 14
- (c) 11
- (d) 13

Question 8. Write an equation for three fourth of t is 15.

- (a) $\frac{3}{4}t = 15$
- (b) $\frac{3}{4} + t = 15$
- (c) $\frac{3}{4} - t = 15$
- (d) None of these

Question 9. The solution of the equation $4m - 2 = 18$ is $m =$

- (a) 4
- (b) 6
- (c) 5
- (d) none of these

Question 10. Write an equation in statement form : $2m = 7$.

- (a) Two times of a number m is 7.
- (b) Two added to m becomes 7.
- (c) Two subtracted from m becomes 7.
- (d) None of these.

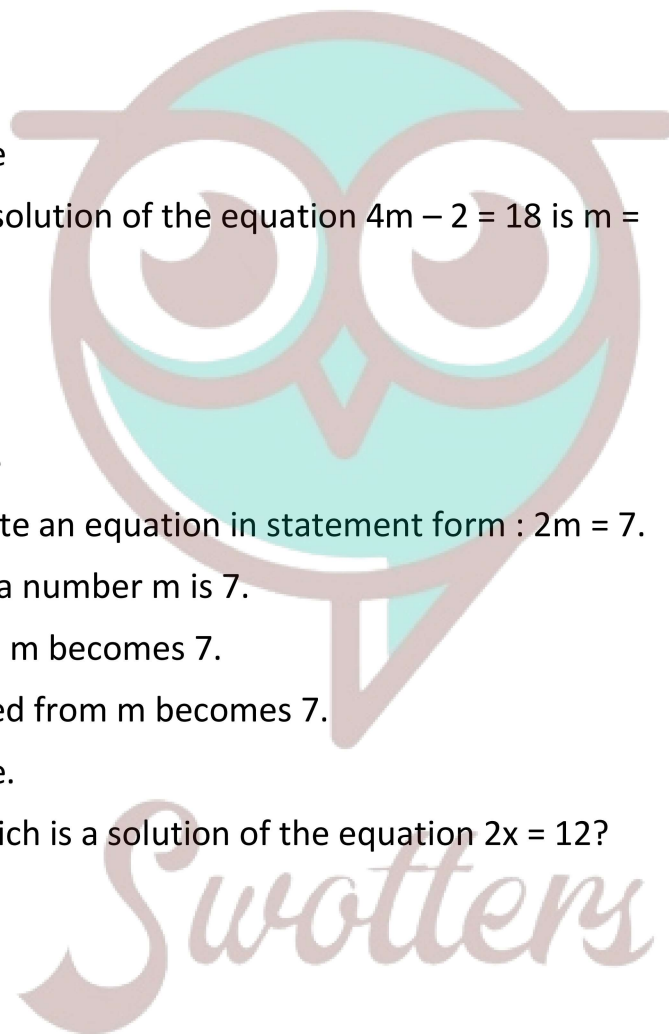
Question 11. Which is a solution of the equation $2x = 12$?

- (a) $x = 4$
- (b) $x = 6$
- (c) $x = 5$
- (d) $x = 7$

Question 12. Write an equation for 2 subtracted from y is 8.

- (a) $y - 2 = 8$
- (b) $2y = 8$
- (c) $y + 2 = 8$
- (d) None of these

Question 13. Write the statements "If you take away 6 from 6 time a number, you get 60" in the form of equations:



- (a) $6x + 6 = 60$
- (b) $6x - 5 = 60$
- (c) $6x - 6 = 60$
- (d) None of these

Question 14. Solve the given equation : $\frac{b}{2} = 6$.

- (a) 6
- (b) 3
- (c) 12
- (d) None of these

Question 15. The solution of the equation $\frac{20m}{3} = 40$ is $m =$

- (a) 5
- (b) 6
- (c) 7
- (d) none of these

Very Short Questions :

1. Write the following statements in the form of equations.
 - (a) The sum of four times a number and 5 gives a number five times of it.
 - (b) One-fourth of a number is 2 more than 5.
2. Convert the following equations in statement form:
 - (a) $5x = 20$
 - (b) $3y + 7 = 1$
3. If $k + 7 = 10$, find the value of $9k - 50$.
4. Solve the following equations and check the answers.

(a) $\frac{5z + 1}{3} = 7$ (b) $\frac{5x}{3} + 3 = x + 7$

5. Solve the following equations:

$3(y - 2) = 2(y - 1) - 3$

Short Questions :

1. If 5 is added to twice a number, the result is 29. Find the number.
2. If one-third of a number exceeds its one-fourth by 1, find the number.
3. The length of a rectangle is twice its breadth. If its perimeter is 60 cm, find the

length and the breadth of the rectangle.

4. Seven times a number is 12 less than thirteen times the same number. Find the number.
5. The present age of a son is half the present age of his father. Ten years ago, the father was thrice as old as his son. What are their present age?

Long Questions :

1. The sum of three consecutive multiples of 2 is 18. Find the numbers.
2. 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.
3. 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?

Assertion and Reason Questions:

1.) Assertion: if $x = 2$, $y = 1$ is a solution of the equation $2x + 3y = k$, then the value of k is 7.

Reason: the solution of the line will satisfy the equation of the line.

- a.) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion
- b.) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.
- c.) assertion is true but the reason is false.
- d.) both assertion and reason are false.

2.) Assertion: Expressions are formed by performing operations like addition, subtraction, multiplication and division on the variables.

Reason: $6x - 3$ is an expression in variable x .

- a.) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion
- b.) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.
- c.) assertion is true but the reason is false.
- d.) both assertion and reason are false.

ANSWER KEY -

Multiple Choice questions :

1. (a) $7x + 7 = 77$

2. (a) 16
3. (c) $x = 4$
4. (a) $6y - 6 = 60$
5. (c) 10
6. (c) -4
7. (c) 11
8. (a) $\frac{3}{4}t = 15$
9. (c) 5
10. (a) Two times of a number m is 7.
11. (b) $x = 6$
12. (d) None of these
13. (c) $6x - 6 = 60$
14. (c) 12
15. (b) 6

Very Short Answer :

1. (a) Let the number be x .
Sum of $4x$ and $5 = 4x + 5$
The sum is $5x$.
The equation is $4x + 5 = 5x$ as required.

(b) Let the number be x .

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

$$\Rightarrow \frac{1}{4}x = 7 \text{ as required.}$$

2. (a) Five times a number x gives 20.
(b) Add 7 to three times a number y gives 1.

3. $k + 7 = 10$

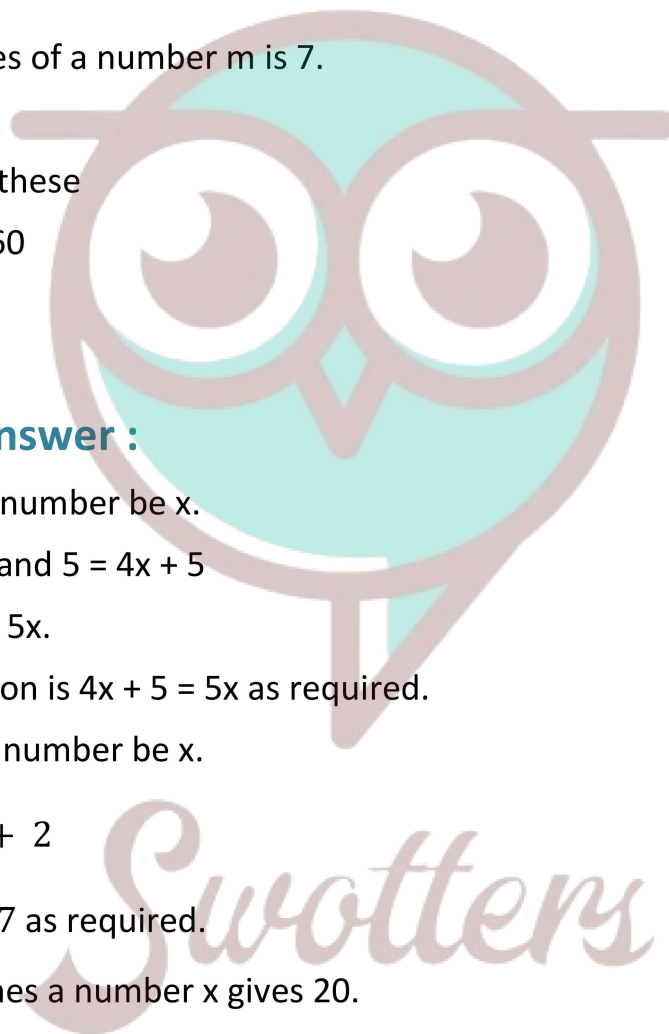
$$\Rightarrow k = 10 - 7 = 3$$

Put $k = 3$ in $9k - 50$, we get

$$9 \times 3 - 50 = 27 - 50 = -23$$

Thus the value of $k = -23$

4.



$$(a) \frac{5z + 1}{3} = 7$$

$$\Rightarrow \frac{5z + 1}{3} \times 3 = 7 \times 3$$

(Multiplying both sides by 3)

$$\Rightarrow 5z + 1 = 21$$

$$\Rightarrow 5z = 21 - 1 \quad (\text{Transposing 1 to RHS})$$

$$\Rightarrow 5z = 20$$

$$\Rightarrow \frac{5z}{5} = \frac{20}{5} \quad (\text{Dividing both sides by 5})$$

$$\Rightarrow z = 4$$

Check: Put $z = 4$ in LHS

$$\frac{5 \times 4 + 1}{3} = \frac{20 + 1}{3} = \frac{21}{3}$$

= 7 RHS as required.

$$(b) \frac{5x}{3} + 3 = x + 7$$

$$\Rightarrow \frac{5x}{3} - x = 7 - 3 \quad (\text{Transposing 3 to RHS and } x \text{ to LHS})$$

$$\Rightarrow \frac{5x - 3x}{3} = 4$$

$$\Rightarrow \frac{2x}{3} = 4$$

$$\Rightarrow \frac{2x}{3} \times 3 = 4 \times 3 \quad (\text{Multiplying both sides by 3})$$

$$\Rightarrow 2x = 12$$

$$\Rightarrow \frac{2x}{2} = \frac{12}{2} \quad (\text{Dividing both sides by 2})$$

$$\Rightarrow x = 6$$

Check: Put $x = 6$ in LHS

$$\frac{5 \times 6}{3} + 3 = 10 + 3 = 13$$

Put $x = 6$ in RHS

$$6 + 7 = 13$$

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

Hence verified.

5. $3(y - 2) = 2(y - 1) - 3$

$$\Rightarrow 3y - 6 = 2y - 2 - 3 \quad (\text{Removing the brackets})$$

$$\Rightarrow 3y - 6 = 2y - 5$$

$$\Rightarrow 3y - 2y = 6 - 5 \quad (\text{Transposing 6 to RHS and } 2y \text{ to LHS})$$

$$\Rightarrow y = 1$$

Thus $y = 1$

Short Answer :

1. Let the required number be x.

Step I: $2x + 5$

Step II: $2x + 5 = 29$

Solving the equation, we get

$$2x + 5 = 29$$

$$\Rightarrow 2x = 29 - 5 \text{ (Transposing 5 to RHS)}$$

$$\Rightarrow 2x = 24$$

$$\Rightarrow x = 12 \text{ (Dividing both sides by 2)}$$

$$\Rightarrow x = 12$$

Thus the required number is 12.

2. Let the required number be x.

$$\therefore \frac{1}{3}x - \frac{1}{4}x = 1 \Rightarrow \frac{4x - 3x}{12} = 1$$

$$\Rightarrow \frac{x}{12} = 1 \Rightarrow \frac{x}{12} \times 12 = 1 \times 12$$

(Multiplying both sides by 12)

$$\Rightarrow x = 12$$

Thus, the required number is 12.

3. Let the breadth of the rectangle be x cm.

its length = $2x$

$$\text{Perimeter} = 2(\text{length} + \text{breadth}) = 2(2x + x) = 2 \times 3x = 6x$$

As per the condition of the question, we have

$$6x = 60 \Rightarrow x = 10$$

Thus the required breadth = 10 cm

and the length = $10 \times 2 = 20$ cm.

4. Let the required number be x.

$$7x = 13x - 12$$

$$\Rightarrow 7x - 13x = -12 \text{ (Transposing 13x to LHS)}$$

$$\Rightarrow -6x = -12$$

$$\Rightarrow x = 2$$

Thus, the required number is 2.

5. Let the present age of a father be x years.

Son's age = $\frac{1}{2}x$ years

10 years ago, father's age was $(x - 10)$ years

10 years ago, son's age was $\left(\frac{x}{2} - 10\right)$ years

As per the question, we have

$$x = 3\left(\frac{x}{2} - 10\right)$$

$$\Rightarrow x - 10 = \frac{3x}{2} - 30$$

Transposing 10 on RHS and $\frac{3x}{2}$ on LHS, we get

$$x - \frac{3x}{2} = 10 - 30$$

$$\frac{2x - 3x}{2} = -20$$

$$\frac{-x}{2} = -20$$

$$-x = -20 \times 2$$

$$-x = -40$$

$$x = 40$$

Thus, present age of father = 40 years

and age of son = $\frac{1}{2} \times 40 = 20$ years

Long Answer :

- Let the three consecutive multiples of 2 be $2x$, $2x + 2$ and $2x + 4$.

As per the conditions of the question, we have

$$2x + (2x + 2) + (2x + 4) = 18$$

$$\Rightarrow 2x + 2x + 2 + 2x + 4 = 18$$

$$\Rightarrow 6x + 6 = 18$$

$$\Rightarrow 6x = 18 - 6 \text{ (Transposing 6 to RHS)}$$

$$\Rightarrow 6x = 12$$

$$\Rightarrow x = 2$$

Thus, the required multiples are

$$2 \times 2 = 4, 4 + 2 = 6, 6 + 2 = 8 \text{ i.e., } 4, 6 \text{ and } 8.$$

- Let the length of the third side be x cm.

Each equal side = $2x$ cm.

As per the condition of the question, we have

$$\text{Perimeter} = x + 2x + 2x = 30$$

$$\Rightarrow 5x = 30$$

$$\Rightarrow x = 6$$

Thus, the third side of the triangle = 6 cm

and other two equal sides are $2 \times 6 = 12$ cm each

3. Let the total length of total journey be x km.

$$\text{Distance travelled by train} = \frac{2}{5}x \text{ km}$$

$$\text{Distance travelled by bus} = \frac{1}{3}x \text{ km}$$

$$\text{Distance travelled by car} = \frac{1}{4}x \text{ km}$$

Remaining distance = 3 km

As per the question, we have

$$\begin{aligned}
 &x = \frac{2}{5}x + \frac{1}{3}x + \frac{1}{4}x + 3 \\
 \Rightarrow &x - \frac{2}{5}x - \frac{1}{3}x - \frac{1}{4}x = 3 \\
 \Rightarrow &\frac{60x - 24x - 20x - 15x}{60} = 3 \\
 &\quad \quad \quad \text{[LCM of 5, 3 and 4 = 60]} \\
 \Rightarrow &\frac{60x - 59x}{60} = 3 \\
 \Rightarrow &\frac{x}{60} = 3 \\
 \Rightarrow &x = 3 \times 60 = 180 \text{ km}
 \end{aligned}$$

Thus, the required journey = 180 km.

Assertion and Reason Answers:

- 1) a) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion
- 2) a.) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion