Practice Set 12.1 8th Std Maths Answers Chapter 12 Equations in One Variable

Equation in One Variable Practice Set 12.1 Question 1. Each equation is followed by the values of the variable. Decide whether these values are the solutions of that equation.
i. x – 4 = 3, x = – 1, 7, – 7
ii. 9m = 81, m = 3, 9, -3
iii. 2a + 4 = 0, a = 2, – 2, 1
iv. 3 – y = 4, y = – 1, 1, 2
Solution:
i. x – 4 = 3 ....(i)
Substituting x = – 1 in L.H.S. of equation (i),
L.H.S. = (-1) – 4
= – 5
R.H.S. = 3
∴ L.H.S. ≠ R.H.S.
∴ x = – 1 is not the solution of the given equation.

Substituting x = 7 in L.H.S. of equation (i),
L.H.S. = (7) – 4
= 3
R.H.S. = 3
∴ L.H.S. = R.H.S.
∴ x = 7 is the solution of the given equation.

Substituting x = – 7 in L.H.S. of equation (i),
L.H.S. = (- 7) – 4
= -11
R.H.S. = 3
∴ L.H.S. ≠ R.H.S.
∴ x = – 7 is not the solution of the given equation.

ii. 9m = 81 ...(i)
Substituting m = 3 in L.H.S. of equation (i),
L.H.S. = 9 × (3)
= 27
R.H.S. = 81
∴L.H.S. ≠ R.H.S.
∴m = 3 is not the solution of the given equation.

Substituting m = 9 in L.H.S. of equation (i),
L.H.S. = 9 × (9)
= 81
R.H.S. = 81
∴L.H.S. = R.H.S.
∴m = 9 is the solution of the given equation.

Substituting m = − 3 in L.H.S. of equation (i),

L.H.S. = 9 × (- 3)

= -27

R.H.S. = 81

∴L.H.S. ≠ R.H.S.

∴m = − 3 is not the solution of the given equation.

iii. 2a + 4 = 0 .....(i)

Substituting a = 2 in L.H.S. of equation (i),

L.H.S. = 2 (2) + 4

= 4 + 4

= 8

R.H.S. = 0

∴L.H.S. ≠ R.H.S.

∴a = 2 is not the solution of the given equation.

Substituting a = − 2 in L.H.S. of equation (i),

L.H.S. = 2 (-2)+ 4

= -4 + 4

= 0

R.H.S. = 0

∴L.H.S. = R.H.S.

∴a = − 2 is the solution of the given equation.

Substituting a = 1 in L.H.S. of equation (i),

L.H.S. = 2(1)+ 4

= 2 + 4

= 6

R.H.S. = 0

∴ L.H.S. ≠ R.H.S.

∴a = 1 is not the solution of the given equation.

iv. 3 − y = 4 ...(i)

Substituting y = -1 in L.H.S. of equation (i),

L.H.S. = 3 − (- 1)

= 3 + 1

= 4

R.H.S. = 4

∴L.H.S. = R.H.S.

∴y = − 1 is the solution of the given equation.

Substituting y = 1 in L.H.S. of equation (i),

L.H.S. = 3-(1)

= 2

R.H.S. = 4

∴L.H.S. ≠ R.H.S.

∴y = 1 is not the solution of the given equation.

Substituting y = 2 in L.H.S. of equation (i),

L.H.S. = 3-(2)

= 1

R.H.S. = 4

∴L.H.S. ≠ R.H.S.

∴y = 2 is not the solution of the given equation.

Practice Set 12.1 Question 2.

Solve the following equations:

i. 17p – 2 = 49

ii. 2m + 7 = 9

iii. 3x + 12 = 2x – 4

iv. 5 (x – 3) = 3 (x + 2)

v. $\frac{9x}{8} + 1 = 10$

vi. $\frac{y}{7} + \frac{y-4}{3} = 2$

vii. 13x – 5 = 32

viii. 3 (y + 8) = 10 (y – 4) + 8

ix. $x - \frac{9x-5}{7} = 57$

x. $\frac{y-4}{3} + 3y = 4$

xi. $\frac{b+(b+1)+(b+2)}{4} = 21$

Solution:

i. 17p – 2 = 49

∴ 17p – 2 + 2 = 49 + 2

…[Adding 2 on both the sides]

∴ 17p = 51

∴ $\frac{17p}{17} = \frac{51}{17}$ …[Dividing both the sides by 17]

p = 3

ii. 2m + 7 = 9

∴ 2m + 7 – 7 = 9 – 7

…[Subtracting 7 from both the sides]

∴ 2m = 2

∴ $\frac{2m}{2} = \frac{2}{2}$ [Dividing both the sides by 2]

∴ m = 1

iii. 3x + 12 = 2x – 4

∴ 3x + 12 – 12 = 2x – 4 – 12

…[Subtracting 12 from both the sides]

∴ 3x = 2x – 16

∴ 3x – 2x = 2x – 16 – 2x

…[Subtracting 2x from both the sides]

∴ x = – 16

iv. 5 (x – 3) = 3 (x + 2)

∴ 5x – 15 = 3x + 6

∴ 5x – 15 + 15 = 3x + 6 + 15

...[Adding 15 on both the sides]

∴ 5x = 3x + 21

∴ 5x – 3x = 3x + 21 – 3x

...[Subtracting 3x from both the sides]

∴ 2x = 21

∴ $\frac{2x}{2} = \frac{21}{2}$ ...[Dividing both the sides by 2]

∴ $x = \frac{21}{2}$

v. $\frac{9x}{8} + 1 = 10$

∴ $\frac{9x}{8} + 1 - 1 = 10 - 1$

...[Subtracting 1 from both the sides]

∴ $\frac{9x}{8} = 9$

∴ $\frac{9x}{8} \times 8 = 9 \times 8$

...[Multiplying both the sides by 8]

∴ $9x = 72$

∴ $\frac{9x}{9} = \frac{72}{9}$ ...[Dividing both the sides by 9]

∴ $x = 8$

∴ 5x – 15 + 15 = 3x + 6 + 15

...[Adding 15 on both the sides]

4

vi. $\frac{y}{7} + \frac{y-4}{3} = 2$

$\therefore \quad \frac{y \times 3}{7 \times 3} + \frac{(y-4) \times 7}{3 \times 7} = 2$

$\therefore \quad \frac{3y}{21} + \frac{7y - 28}{21} = 2$

$\therefore \quad \frac{3y + 7y - 28}{21} = 2$

$\therefore \quad \frac{10y - 28}{21} = 2$

$\therefore \quad \frac{10y - 28}{21} \times 21 = 2 \times 21$

...[Multiplying both the sides by 21]

$\therefore \quad 10y - 28 = 42$

$\therefore \quad 10y - 28 + 28 = 42 + 28$

...[Adding 28 on both the sides]

$\therefore \quad 10y = 70$

$\therefore \quad \frac{10y}{10} = \frac{70}{10}$ ...[Dividing both the sides by 10]

$\therefore \quad y = 7$

vii. $13x - 5 = \frac{3}{2}$

$\therefore \quad (13x - 5) \times 2 = \frac{3}{2} \times 2$

...[Multiplying both the sides by 2]

$\therefore \quad 26x - 10 = 3$

$\therefore \quad 26x - 10 + 10 = 3 + 10$

...[Adding 10 on both the sides]

$\therefore \quad 26x = 13$

$\therefore \quad \frac{26x}{26} = \frac{13}{26}$ ...[Dividing both the sides by 26]

$\therefore \quad x = \frac{1}{2}$

viii. $3(y + 8) = 10(y - 4) + 8$
$\therefore 3y + 24 = 10y - 40 + 8$
$\therefore 3y + 24 = 10y - 32$

$\therefore$ 3y + 24 − 24 = 10y − 32 − 24

...[Subtracting 24 from both the sides]

$\therefore$ 3y = 10y − 56

$\therefore$ 3y − 10y = 10y − 56

...[Subtracting 10y from both the sides]

$\therefore$ − 7y = − 56

$\therefore \frac{-7y}{-7} = \frac{-56}{-7}$ ...[Dividing both the sides by − 7]

$\therefore$ y = 8

ix. $x - \frac{9x-5}{7} = 57$

$\therefore x - \frac{9x-5}{7} \times 7(x-5) = 57 \times 7(x-5)$

...[Multiplying both the sides by 7 (x − 5)]

$\therefore$ 7 (x − 9) = 5 (x − 5)

$\therefore$ 7x − 63 = 5x − 25

$\therefore$ 7x − 63 + 63 = 5x − 25 + 63

...[Adding 63 on both the sides]

$\therefore$ 7x = 5x + 38

$\therefore$ 7x − 5x = 5x + 38 − 5x

...[Subtracting 5x from both the sides]

$\therefore$ 2x = 38

$\therefore \frac{2x}{2} = \frac{38}{2}$ ...[Dividing both the sides by 2]

$\therefore$ x = 19

x. $\frac{y-4}{3} + 3y = 4$

$\therefore \frac{y-4}{3} \times 3 + 3y \times 3 = 4 \times 3$

...[Multiplying both the sides by 3]

$\therefore$ y − 4 + 9y = 12

$\therefore$ 10y − 4 = 12

$\therefore$ 10y − 4 + 4 = 12 + 4

...[Adding 4 on both the sides]

$\therefore$ 10y = 16

$\therefore \frac{10y}{10} = \frac{16}{10}$ ...[Dividing both the sides by 10]

$\therefore$ y = $\frac{8}{5}$

xi. $\frac{b+(b+1)+(b+2)}{4} = 21$

$\therefore \frac{b+(b+1)+(b+2)}{4} \times 4 = 21 \times 4$

...[Multiplying both the sides by 4]

$\therefore$ b + b + 1 + b + 2 = 84

$\therefore$ 3b + 3 = 84

$\therefore$ 3b + 3 − 3 = 84 − 3

...[Subtracting 3 from both the sides]

$\therefore$ 3b = 81

$\therefore \frac{3b}{3} = \frac{81}{3}$ ...[Dividing both the sides by 3]

$\therefore$ b = 27

Maharashtra Board Class 8 Maths Chapter 12 Equations in One Variable Practice Set 12.1 Intext Questions and Activities

Std 8 Maths Practice Set 12.1 Question 1.
Fill in the boxes to solve the following equations. (Textbook pg. no. 75)
i. x + 4 = 9
∴x + 4 − __ = 9 − __
... [Subtracting 4 from both the sides]
∴ x = __

ii. x − 2 = 7
∴x − 2 + __ = 7 + __
... [Adding 2 on both the sides]
∴x = __

iii. [latex]\frac { x }{ 3 }=4\)
∴$\frac{x}{3}$ × __ = 4 ×__
∴x = __

iv. 4x = 24
∴ __ = __
∴x = __
Solution:
i. x + 4 = 9
∴x + 4 − 4 = 9 − 4
... [Subtracting 4 from both the sides]
∴ x = 5

ii. x − 2 = 7
∴x − 2 + 2 = 7 + 2
... [Adding 2 on both the sides]
∴x = 9

iii. $\frac{x}{3}=4$
∴$\frac{x}{3}$ × 3 = 4 × 3
... [Multiplying both the sides by 3]
∴x = 12

iv. 4x = 24
∴ $\frac{4x}{4}=\frac{24}{4}$
... [Dividing both the sides by 4]
∴x = 6

Practice Set 12.2 8th Std Maths Answers Chapter 12 Equations in One Variable

Equation In One Variable Practice Set 12.2 Question 1.
Mother is 25 years older than her son. Find son's age, if after 8 years ratio of son's age to mother's age will be $\frac{4}{9}$.
Solution:
Let the son's present age be x years.
∴ Mother's present age = (x + 25) years
After 8 years,
Son's age = (x + 8) years
Mother's age = (x + 25 + 8) = (x + 33) years
Since, the ratio of the son's age to mother's age after 8 years is $\frac{4}{9}$.

∴ $\frac{x+8}{x+33} = \frac{4}{9}$

∴ 9 (x + 8) = 4 (x + 33)
∴ 9x + 72 = 4x + 132
∴ 9x – 4x = 132 – 72
∴ 5x = 60
∴ x = $\frac{60}{5}$
∴ x = 12
∴ Son's present age is 12 years.

8th Std Maths Practice Set 12.2 Question 2.
The denominator of a fraction is greater than its numerator by 12. If the numerator is decreased by 2 and the denominator is increased by 7, the new fraction is equivalent to $\frac{1}{2}$. Find the fraction.
Solution:
Let the numerator of the fraction be x.
The denominator of a fraction is greater than its numerator by 12.
∴ Denominator of the fraction = (x + 12)
∴ The required fraction = $\frac{x}{x+12}$
For the new fraction,
numerator is decreased by 2.
∴ The new numerator = (x – 2)
Also, denominator is increased by 7.
∴ The new denominator = (x + 12) + 7
= (x + 19)
Since, the new fraction is equivalent to $\frac{1}{2}$.

∴ $\frac{x-2}{x+19} = \frac{1}{2}$

∴ 2(x – 2) = 1(x + 19)
∴ 2x – 4 = x + 19
∴ 2x – x = 19 + 4
∴ x = 23

∴ The required fraction = $\frac{x}{x+12} = \frac{23}{23+12} = \frac{23}{35}$

∴ The required fraction is $\frac{23}{35}$

Practice Set 12.2 Class 8 Question 3.
The ratio of the weights of copper and zinc in brass is 13:7. Find the weight of zinc in a brass utensil weighing 700 gm.
Solution:
Let the weight of zinc in the brass utensil be x gm.
Since, the ratio of the weights of copper to zinc in brass is 13:7.

$$\therefore \frac{\text{Weight of copper}}{\text{Weight of zinc}} = \frac{13}{7}$$

$$\therefore \frac{\text{Weight of copper}}{x} = \frac{13}{7}$$

$\therefore$ Weight of copper in the brass utensil = $\left(\frac{13}{7}x\right)$ gm

The weight of the brass utensil = 700 gm

$\therefore \frac{13}{7}x + x = 700$

$\therefore \frac{13}{7}x \times 7 + x \times 7 = 700 \times 7$

$\therefore 13x + 7x = 4900$

$\therefore 20x = 4900$

$\therefore x = \frac{4900}{20}$

$\therefore x = 245$

$\therefore$ The weight of zinc in the brass utensil is 245 gm.

Practice Set 12.2 8th Class Question 4.
Find three consecutive whole numbers whose sum is more than 45 but less than 54.
Solution:
Let the three consecutive whole numbers be (x – 1), x and (x + 1).
$\therefore$ Sum of the three numbers
= (x – 1) + x + (x + 1)
= 3x
Given that, the sum of the three numbers is greater than 45 and less than 54.
When the sum of the three numbers is 45,
3x = 45
$\therefore x = \frac{45}{3}$
$\therefore x = 15$
When the sum of the three numbers is 54,
$\therefore 3x = 54$
$\therefore x = \frac{54}{3}$
$\therefore x = 18$
$\therefore$ the value of x is greater than 15 and less than 18.
$\therefore$ the value of x is either 16 or 17

Case I:
If the value of x is 16, then the three consecutive whole numbers are
(16 – 1), 16,(16 + 1)i.e., 15, 16, 17

Case II:
If the value of x is 17, then the three consecutive whole numbers are (17 – 1), 17, (17 + 1)

i.e., 16, 17, 18.
∴ The three consecutive whole numbers are 15, 16, 17 or 16, 17, 18.

Practice Set 12.2 8th Standard Question 5.
In a two-digit number, digit at the ten's place is twice the digit at unit's place. If the number obtained by interchanging the digits is added to the original number, the sum is 66. Find the number.
Solution:
Let the digit at unit's place be x.
The digit at the ten's place is twice the digit at unit's place.
∴ The digit at ten's place = 2x

	Digit in units place	Digit in tens place	Number
Original Number	x	2x	(2x × 10) + x = 20x + x = 21x
New Number	2x	x	(x × 10) + 2x = 10x + 2x = 12x

Since, the sum of the original number and the new number is 66.
∴ 21x + 12x = 66
∴ 33x = 66
∴ x = $\frac{66}{33}$
∴ x = 2
∴ Original number = 21x = 21 × 2 = 42
∴ the original number is 42.

8th Standard Maths Practice Set 12.2 Question 6.
Some tickets of Rs 200 and some of Rs 100, of a drama in a theatre were sold. The number of tickets of Rs 200 sold was 20 more than the number of tickets of Rs 100. The total amount received by the theatre by sale of tickets was Rs 37000. Find the number of Rs 100 tickets sold.
Solution:
Let the number of tickets sold of Rs 100 be x.
The number of tickets of Rs 200 sold was 20 more than the number of tickets of Rs 100.
∴ Number of tickets sold of Rs 200 = (x + 20)
∴ Total amount received by the theatre through the sale of tickets = 100 × x + 200 × (x + 20)
= 100x + 200x + 4000
= 300x + 4000
Since, the total amount received by the theatre through the sale of tickets = Rs 37000
∴ 300x + 4000 = 37000
∴ 300x = 37000 – 4000
∴ 300x = 33000

∴ $x = \frac{33000}{300}$

∴ x = 110
∴ 110 tickets of Rs 100 were sold.

8th Maths Practice Set 12.2 Question 7.

Of the three consecutive natural numbers, five times the smallest number is 9 more than four times the greatest number, find the numbers.

Solution:

Let the three consecutive natural numbers be $(x – 1)$, x and $(x + 1)$.

Here, the smallest number is $(x – 1)$ and the greatest number is $(x + 1)$.

Since, five times the smallest number is 9 more than four times the greatest number.

∴ $5 \times (x – 1) = [4 \times (x + 1)] + 9$

∴ $5x – 5 = 4x + 4 + 9$

∴ $5x – 5 = 4x + 13$

∴ $5x – 4x = 13 + 5$

∴ $x = 18$.

∴ the three numbers are $(18 – 1)$, 18, $(18 + 1)$

i. e., 17, 18, 19

∴ The three consecutive natural numbers are 17, 18 and 19.

Raju Sold A Bicycle to Amit at 8 Question 8.

Raju sold a bicycle to Amit at 8% profit. Amit repaired it spending Rs 54. Then he sold the bicycle to Nikhil for Rs 1134 with no loss and no profit. Find the cost price of the bicycle for which Raju purchased it.

Solution:

Let the cost price at which Raju purchased the bicycle be Rs x.

Since, Raju sold the bicycle at 8% profit to Amit.

∴ Selling price of bicycle for Raju = x + 8% of x

$$= x + \frac{8}{100}\, x$$

$$= \frac{100x + 8x}{100}$$

$$= \frac{108x}{100}$$

Since, Amit spent Rs 54 on repairing the bicycle and then sold it to Nikhil for Rs 1134, at no loss and no profit.

∴ Selling price of bicycle + repairing cost = Rs 1134

$$\therefore \quad \frac{108x}{100} + 54 = 1134$$

$$\therefore \quad \frac{108x}{100} = 1134 - 54$$

$$\therefore \quad \frac{108x}{100} = 1080$$

$$\therefore \quad 108x = 1080 \times 100$$

$$\therefore \quad 108x = 108000$$

$$\therefore \quad x = \frac{108000}{108}$$

$$\therefore \quad x = 1000$$

∴ The cost price of the bicycle at which Raju purchased it is Rs 1000.

Class 8 Maths Practice Set 12.2 Question 9.
A cricket player scored 180 runs in the first match and 257 runs in the second match. Find the number of runs he should score in the third match so that the average of runs in the three matches be 230.
Solution:
Let the number of runs required by the cricket player to score in the third match be x.
Number of runs scored by the player in first match = 180
Number of runs scored in second match = 257
∴ Total runs scored by the player = 180 + 257 + x = 437 + x
Average of runs in the three matches = $\frac{437+x}{3}$
Since, the average of runs should be 230.

$$\frac{437+x}{3} = 230$$

∴ 437 + x = 230 × 3
∴ 437 + x = 690
∴ x = 690 – 437
∴ x = 253
∴ The cricket player should score 253 runs in the third match.

8th Class Math Practice Set 12.2 Question 10.
Sudhir's present age is 5 more than three times the age of Viru. Anil's age is half the age of Sudhir. If the ratio of the sum of Sudhir's and Viru's age to three times Anil's age is 5:6, then find Viru's age.
Solution:
Let Viru's present age be x years.
Sudhir's present age is 5 more than three times the age of Viru.
∴ Sudhir's present age = (3x + 5) years
Anil's age is half the age of Sudhir.

∴ Anil's present age = $\left(\frac{3x+5}{2}\right)$ years

Since, the ratio of the sum of Sudhir's and Viru's age to three times Anil's age is 5:6.

$$\therefore \quad \frac{(3x+5)+x}{3 \times \left(\frac{3x+5}{2}\right)} = \frac{5}{6}$$

$$\therefore \quad \frac{4x+5}{\left(\frac{3}{2}\right)(3x+5)} = \frac{5}{6}$$

$$\therefore \quad 6 \times (4x+5) = \left(\frac{3}{2}\right)(3x+5) \times 5$$

$$\therefore \quad 24x + 30 = \left(\frac{9x+15}{2}\right) \times 5$$

$$\therefore \quad 24x + 30 = \frac{45x+75}{2}$$

$\therefore 2 \times (24x + 30) = 45x + 75$

$\therefore 48x + 60 = 45x + 75$

$\therefore 48x - 45x = 75 - 60$

$\therefore 3x = 15$

$\therefore x = 153$

$\therefore x = 5$

$\therefore$ Viru's present age is 5 years.

Maharashtra Board Class 8 Maths Chapter 12 Equations in One Variable Practice Set 12.2 Intext Questions and Activities

8th Math Practice Set 12.2 Question 1.
Write correct numbers in the boxes given. (Textbook pg. no. 78)
length is 3 times the breadth

I am a rectangle.
My perimeter is 40 cm. | Breadth is x

Perimeter of the rectangle = 40

2(__x + __x) = 40

2 × __ x = 40

__ x = 40

x = __

$\therefore$ Breadth of rectangle = __ cm and Length of rectangle = __ cm

Solution:
length is 3 times the breadth

I am a rectangle.
My perimeter is 40 cm. | Breadth is x

Perimeter of the rectangle = 40

$\therefore 2(3x + 1x) = 40$

$\therefore 2 \times 4x = 40$

$\therefore$ 8x = 40

$\therefore$ x = 5

$\therefore$ Breadth of rectangle = 5 cm and Length of rectangle = 15 cm