

EXERCISE 12A

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Solve the following questions:

1. $x + 5 = 10$

Solution:

$$x + 5 = 10$$

So we get

$$x = 10 - 5 = 5$$

2. $2 + y = 7$

Solution:

$$2 + y = 7$$

So we get

$$y = 7 - 2 = 5$$

3. $a - 2 = 6$

Solution:

$$a - 2 = 6$$

So we get

$$a = 6 + 2 = 8$$

4. $x - 5 = 8$

Solution:

$$x - 5 = 8$$

So we get

$$x = 8 + 5 = 13$$

5. $5 - d = 12$

Solution:

$$5 - d = 12$$

So we get

$$-d = 12 - 5 = 7$$

$$d = -7$$

6. $3p = 12$

Solution:

$$3p = 12$$

So we get

$$p = 12/3 = 4$$

7. $14 = 7m$

Solution:

$$14 = 7m$$

So we get
 $m = 14/7 = 2$

8. $2x = 0$

Solution:

$2x = 0$
So we get
 $x = 0/2 = 0$

9. $x/9 = 2$

Solution:

$x/9 = 2$
So we get
 $x = 2 \times 9 = 18$

10. $y/-12 = -4$

Solution:

$y/-12 = -4$
So we get
 $y = -4 \times -12 = 48$

11. $8x - 2 = 38$

Solution:

$8x - 2 = 38$
So we get
 $8x = 38 + 2$
 $8x = 40$
 $x = 40/8 = 5$

12. $2x + 5 = 5$

Solution:

$2x + 5 = 5$
So we get
 $2x = 5 - 5$
 $2x = 0$
 $x = 0/2 = 0$

13. $5x - 1 = 74$

Solution:

$5x - 1 = 74$
So we get
 $5x = 74 + 1$
 $5x = 75$
 $x = 75/5 = 15$

14. $14 = 27 - x$

Solution:

$$14 = 27 - x$$

So we get

$$x = 27 - 14 = 13$$

15. $10 + 6a = 40$

Solution:

$$10 + 6a = 40$$

So we get

$$6a = 40 - 10$$

$$6a = 30$$

$$a = 30/6 = 5$$



EXERCISE 12B

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Solve:

1. $8y - 4y = 20$

Solution:

$$8y - 4y = 20$$

By further calculation

$$4y = 20$$

So we get

$$y = 20/4 = 5$$

2. $9b - 4b + 3b = 16$

Solution:

$$9b - 4b + 3b = 16$$

By further calculation

$$8b = 16$$

So we get

$$b = 16/8 = 2$$

3. $5y + 8 = 8y - 18$

Solution:

$$5y + 8 = 8y - 18$$

By further calculation

$$8y - 5y = 8 + 18$$

So we get

$$3y = 26$$

$$y = 26/3 = 8 \frac{2}{3}$$

4. $6 = 7 + 2p - 5$

Solution:

$$6 = 7 + 2p - 5$$

By further calculation

$$2p = 6 - 7 + 5$$

So we get

$$2p = 4$$

$$p = 4/2 = 2$$

5. $8 - 7x = 13x + 8$

Solution:

$$8 - 7x = 13x + 8$$

By further calculation

$$13x + 7x = 8 - 8$$

$$20x = 0$$

$$x = 0/20 = 0$$

6. $4x - 5x + 2x = 28 + 3x$

Solution:

$$4x - 5x + 2x = 28 + 3x$$

By further calculation

$$4x - 5x + 2x - 3x = 28$$

So we get

$$-2x = 28$$

$$x = 28/-2 = -14$$

7. $9 + m = 6m + 8 - m$

Solution:

$$9 + m = 6m + 8 - m$$

By further calculation

$$6m - m - m = 9 - 8$$

$$4m = 1$$

So we get

$$m = 1/4$$

8. $24 = y + 2y + 3 + 4y$

Solution:

$$24 = y + 2y + 3 + 4y$$

By further calculation

$$24 - 3 = 7y$$

$$21 = 7y$$

So we get

$$y = 21/7 = 3$$

9. $19x + 13 - 12x + 3 = 23$

Solution:

$$19x + 13 - 12x + 3 = 23$$

By further calculation

$$7x = 23 - 16$$

So we get

$$7x = 7$$

$$x = 7/7 = 1$$

10. $6b + 40 = -100 - b$

Solution:

$$6b + 40 = -100 - b$$

By further calculation

$$7b = -100 - 40$$

$$7b = -140$$

So we get

$$b = -140/7 = -20$$

11. $6 - 5m - 1 + 3m = 0$

Solution:

$$6 - 5m - 1 + 3m = 0$$

By further calculation

$$5 - 2m = 0$$

So we get

$$2m = 5$$

$$m = 5/2 = 2 \frac{1}{2}$$

12. $0.4x - 1.2 = 0.3x + 0.6$

Solution:

$$0.4x - 1.2 = 0.3x + 0.6$$

By further calculation

$$0.1x = 1.8$$

Multiply and divide both numerator and denominator by 10

$$1/10x = 18/10$$

By cross multiplication

$$x = 18/10 \times 10/1 = 18$$

13. $6(x + 4) = 36$

Solution:

$$6(x + 4) = 36$$

By further calculation

$$6x + 24 = 36$$

So we get

$$6x = 36 - 24$$

$$6x = 12$$

$$x = 12/6 = 2$$

14. $9(a + 5) + 2 = 11$

Solution:

$$9(a + 5) + 2 = 11$$

By further calculation

$$9a + 45 + 2 = 11$$

So we get

$$9a = 11 - 47$$

$$9a = -36$$

$$a = -36/9 = -4$$

15. $4(x - 2) = 12$

Solution:

$$4(x - 2) = 12$$

By further calculation

$$4x - 8 = 12$$

So we get

$$4x = 20$$

$$x = 20/4 = 5$$



EXERCISE 12C

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Solve:

1. $x/2 + x = 9$

Solution:

It is given that

$$x/2 + x/1 = 9$$

Taking LCM

$$(x + 2x)/2 = 9$$

By cross multiplication

$$x + 2x = 9 \times 2$$

$$3x = 18$$

So we get

$$x = 18/3 = 6$$

2. $x/5 + 2x = 33$

Solution:

It is given that

$$x/5 + 2x/1 = 33$$

Taking LCM

$$(x + 10x)/5 = 33$$

$$11x/5 = 33$$

By cross multiplication

$$11x = 5 \times 33 = 165$$

So we get

$$x = 165/11 = 15$$

3. $3x/4 + 4x = 38$

Solution:

It is given that

$$3x/4 + 4x/1 = 38$$

Taking LCM

$$(3x + 16x)/4 = 38$$

$$19x/4 = 38$$

By cross multiplication

$$19x = 38 \times 4 = 152$$

So we get

$$x = 152/19 = 8$$

4. $x/2 + x/5 = 14$

Solution:

It is given that

$$x/2 + x/5 = 14$$

Taking LCM

$$(5x + 2x)/10 = 14$$

$$7x/10 = 14$$

By cross multiplication

$$7x = 14 \times 10 = 140$$

So we get

$$x = 140/7 = 20$$

5. $x/3 - x/4 = 2$

Solution:

It is given that

$$x/3 - x/4 = 2$$

Taking LCM

$$(4x - 3x)/12 = 2$$

$$x/12 = 2$$

By cross multiplication

$$x = 12 \times 2 = 24$$

6. $y + y/2 = 7/4 - y/4$

Solution:

It is given that

$$y/1 + y/2 = 7/4 - y/4$$

$$y/1 + y/2 + y/4 = 7/4$$

Taking LCM

$$(4y + 2y + y)/4 = 7/4$$

$$7y/4 = 7/4$$

$$7y = 7$$

So we get

$$y = 7/7 = 1$$

7. $4x/3 - 7x/3 = 1$

Solution:

It is given that

$$4x/3 - 7x/3 = 1$$

By further calculation

$$-3x/3 = 1$$

So we get

$$-x = 1$$

$$x = -1$$

8. $1/2m + 3/4m - m = 2.5$

Solution:

It is given that

$$1/2m + 3/4m - m = 2.5$$

Taking LCM

$$(2m + 3m - 4m)/4 = 2.5$$

$$m/4 = 2.5$$

By cross multiplication

$$m = 2.5 \times 4 = 10$$

9. $2x/3 + x/2 - 3x/4 = 1$

Solution:

It is given that

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

Taking LCM

$$(8x + 6x - 9x)/ 12 = 1$$

$$5x/12 = 1$$

By cross multiplication

$$5x = 1 \times 12 = 12$$

So we get

$$x = 12/5 = 2 \frac{2}{5}$$

10. $3a/4 + a/6 = 66$

Solution:

It is given that

$$3a/4 + a/6 = 66$$

Taking LCM

$$(9a + 2a)/ 12 = 66$$

$$11a/12 = 66$$

By cross multiplication

$$11a = 66 \times 12 = 792$$

So we get

$$a = 792/11 = 72$$

11. $2p/3 - p/5 = 35$

Solution:

It is given that

$$2p/3 - p/5 = 35$$

Taking LCM

$$(10p - 3p)/ 15 = 35$$

$$7p/ 15 = 35$$

By cross multiplication

$$7p = 35 \times 15 = 525$$

So we get

$$p = 525/7 = 75$$

12. $0.6a + 0.2a = 0.4a + 8$

Solution:

It is given that

$$0.6a + 0.2a = 0.4a + 8$$

Multiplying and dividing both numerator and denominator by 10

$$6/10a + 2/10a = 4/10a + 8/1$$

Taking LCM

$$(6a + 2a)/ 10 = (4a + 80)/ 10$$

$$6a + 2a = 4a + 80$$

So we get

$$4a = 80$$
$$a = 80/4 = 20$$

13. $p + 1.4p = 48$

Solution:

It is given that

$$p + 1.4p = 48$$

Multiplying and dividing both numerator and denominator by 10

$$p + 14/10p = 48$$

Taking LCM

$$(10p + 14p)/ 10 = 48$$

$$24p/10 = 48$$

By cross multiplication

$$24p = 48 \times 10 = 480$$

So we get

$$p = 480/24 = 20$$

14. 10% of $x = 20$

Solution:

It is given that

$$10\% \text{ of } x = 20$$

We can write it as

$$10/100 \times x = 20$$

$$x/10 = 20$$

By cross multiplication

$$x = 20 \times 10 = 200$$

15. $y + 20\% \text{ of } y = 18$

Solution:

It is given that

$$y + 20\% \text{ of } y = 18$$

We can write it as

$$y + 20/100 \times y = 18$$

Taking LCM

$$(100y + 20y)/ 100 = 18$$

By cross multiplication

$$120y = 18 \times 100 = 1800$$

So we get

$$y = 1800/120 = 15$$

EXERCISE 12D

1. One-fifth of a number is 5, find the number.

Solution:

Consider the number = x

Based on the condition

$$\frac{1}{5}x = 5$$

By cross multiplication

$$x = 5 \times 5 = 25$$

Hence, the number is 25.

2. Six times a number is 72, find the number.

Solution:

Consider the number = x

Based on the condition

$$6x = 72$$

So we get

$$x = 72/6 = 12$$

Hence, the number is 12.

3. If 15 is added to a number, the result is 69, find the number.

Solution:

Consider the number = x

Based on the condition

$$x + 15 = 69$$

So we get

$$x = 69 - 15 = 54$$

Hence, the number is 54.

4. The sum of twice a number and 4 is 80, find the number.

Solution:

Consider the number = x

Based on the condition

$$2x + 4 = 80$$

So we get

$$2x = 80 - 4 = 76$$

$$x = 76/2 = 38$$

Hence, the number is 38.

5. The difference between a number and one-fourth of itself is 24, find the number.

Solution:

Consider the number = x

Based on the condition

$$x - \frac{1}{4}x = 24$$

Taking LCM

$$\frac{(4x - x)}{4} = 24$$

$$\frac{3x}{4} = 24$$

By cross multiplication

$$x = 24 \times \frac{4}{3}$$

So we get

$$x = 8 \times 4 = 32$$

Hence, the number is 32.

6. Find a number whose one-third part exceeds its one-fifth part by 20.

Solution:

Consider the number = x

Based on the condition

$$\frac{1}{3}x - \frac{1}{5}x = 20$$

Here the LCM of 3 and 5 is 15

$$\frac{(5x - 3x)}{15} = 20$$

$$\frac{2x}{15} = 20$$

So we get

$$x = 20 \times \frac{15}{2} = 150$$

Hence, the number is 150.

7. A number is as much greater than 35 as is less than 53. Find the number.

Solution:

Consider the number = x

Based on the condition

$$x - 35 = 53 - x$$

By further calculation

$$2x = 88$$

So we get

$$x = \frac{88}{2} = 44$$

Hence, the number is 44.

8. The sum of two numbers is 18. If one is twice the other, find the numbers.

Solution:

Consider the first number = x

Second number = y

Based on the condition

$$x + y = 18 \dots\dots (1)$$

$$x = 2y \dots\dots (2)$$

Now substituting the equation (2) in (1)

$$2y + y = 18$$

$$3y = 18$$

So we get

$$y = 18/3 = 6$$

Substituting the value of y in equation (2)

$$x = 2 \times 6 = 12$$

Hence, the two numbers are 12 and 6.

9. A number is 15 more than the other. The sum of the two numbers is 195. Find the numbers.

Solution:

Consider the first number = x

Second number = y

Based on the condition

$$x = y + 15 \dots (1)$$

$$x + y = 195 \dots (2)$$

Now substituting equation (1) in (2) we get

$$y + 15 + y = 195$$

$$2y = 195 - 15 = 180$$

So we get

$$y = 180/2 = 90$$

Substituting the value of y in equation (1)

$$x = 90 + 15 = 105$$

Hence, the two numbers are 105 and 90.

10. The sum of three consecutive even numbers is 54. Find the numbers.

Solution:

Consider the first even number = x

Second even number = $x + 2$

Third even number = $x + 4$

Based on the condition

$$x + x + 2 + x + 4 = 54$$

By further calculation

$$3x + 6 = 54$$

$$3x = 54 - 6 = 48$$

So we get

$$x = 48/3 = 16$$

First even number = 16

Second even number = $16 + 2 = 18$

Third even number = $16 + 4 = 20$

11. The sum of three consecutive odd numbers is 63. Find the numbers.

Solution:

Consider the first odd number = x

Second odd number = $x + 2$

Third odd number = $x + 4$

Based on the condition

$$x + x + 2 + x + 4 = 63$$

By further calculation

$$3x + 6 = 63$$

$$3x = 63 - 6 = 56$$

So we get

$$x = 57/3 = 19$$

First odd number = 19

Second odd number = $19 + 2 = 21$

Third odd number = $19 + 4 = 23$

12. A man has ₹ x from which he spends ₹ 6. If twice of the money left with him is ₹ 86, find x.

Solution:

Consider ₹ x as the total amount

Based on the condition

$$2x = 86$$

By further calculation

$$x = 86/2 = 43$$

Amount spent by him = ₹ 6

So the total money he have = $43 + 6 = ₹ 49$

13. A man is four times as old as his son. After 20 years, he will be twice as old as his son at that time. Find their present ages.

Solution:

Consider the present age of son = x years

So the present age of father = 4x years

After 20 years

Age of son = (x + 20) years

Age of father = (4x + 20) years

Based on the condition

$$4x + 20 = 2(x + 20)$$

By further calculation

$$4x + 20 = 2x + 40$$

$$2x = 20$$

So we get

$$x = 10$$

So the present age of son = 10 years

Present age of father = $4 \times 10 = 40$ years

14. If 5 is subtracted from three times a number, the result is 16. Find the number.

Solution:

Consider x as the number

Based on the condition

$$3x - 5 = 16$$

By further calculation

$$3x = 16 + 5 = 21$$

So we get

$$x = 21/3 = 7$$

Hence, the number is 7.

15. Find three consecutive natural numbers such that the sum of the first and the second is 15 more than the third.

Solution:

Consider the first consecutive number = x

Second consecutive number = $x + 1$

Third consecutive number = $x + 2$

Based on the condition

$$x + x + 1 = 15 + x + 2$$

By further calculation

$$2x + 1 = 17 + x$$

$$2x - x = 17 - 1$$

So we get

$$x = 16$$

First consecutive number = 16

Second consecutive number = $16 + 1 = 17$

Third consecutive number = $16 + 2 = 18$