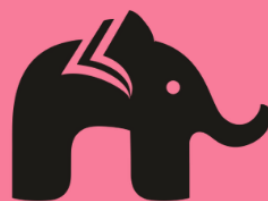
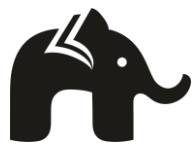


PRACTICE MCQS

CLASS 10 MATHS (TERM - I)
**PAIR OF LINEAR EQUATIONS
IN TWO VARIABLES**

BY
learn-o-hub
learning simplified





Question 1:

The value of k for which the system $kx + 2y = 5$ and $3x + y = 1$ has a unique solution

- (a) $k = 6$
- (b) $k \neq 6$
- (c) $k = 15$
- (d) $k \neq 15$

Answer: (b) $k \neq 6$

Given equations are:

$$kx + 2y = 5$$

$$3x + y = 1$$

For unique solution:

$$k/3 \neq 2/1$$

$$\Rightarrow k/3 \neq 2$$

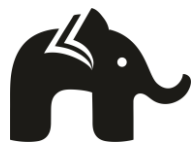
$$\Rightarrow k \neq 2 * 3$$

$$\Rightarrow k \neq 6$$

Question 2:

The sum of the digit of a two digit number is 10. The tens digit is 4 time the one digit, then the number is

- (a) 82
- (b) 28
- (c) 36



(d) 63

Answer: (a) 82

Let the tens digit be x and units digit be y

Therefore, the number is xy .

Tens digit is 4 times the unit digit

So, $x = 4y$

$\Rightarrow x - 4y = 0$ 1

The sum of both the digits is 10

Hence $x + y = 10$ 2

Solving the equations 1 and 2, we get

$x = 8, y = 2$

So, the required number is 82.

Question 3:

Find the value of a for which the following system of equations has infinitely many solutions: $2x + 3y = 7, (a - 1)x + (a + 1)y = 3a - 1$

(a) 3

(b) 5

(c) 7

(d) 10

Answer: (b) 5

Given, equations are:



$$2x + 3y = 7$$

$$(a - 1)x + (a + 1)y = 3a - 1$$

Given, system of equations has infinitely many solutions.

$$\text{So, } 2/(a - 1) = 3/(a + 1) = 7/(3a - 1)$$

$$\Rightarrow 2/(a - 1) = 3/(a + 1)$$

$$\Rightarrow 2(a + 1) = 3(a - 1)$$

$$\Rightarrow 2a + 2 = 3a - 3$$

$$\Rightarrow 3a - 2a = 2 + 3$$

$$\Rightarrow a = 5$$

So, the value of a is 5.

Question 4:

The difference between two numbers is 26 and one number is three times the other, then the numbers are

(a) 13, 39

(b) 14, 42

(c) 15, 45

(d) 20, 60

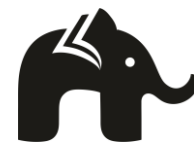
Answer: (a) 13, 39

Let the larger number be = x and the smaller number be = y

The difference between the two numbers is 26

$$x - y = 26$$

$$x = 26 + y$$



Given that one number is three times the other

$$\text{So, } x = 3y$$

Putting the value of x we get

$$26 + y = 3y$$

$$-2y = -26$$

$$y = 13$$

Putting value of y , we get

$$x = 3 * 13 = 39$$

Therefore, the numbers are 13 and 39.

Question 5:

Given linear equations are $3x + 4y = 10$ and $2x - 2y = 2$, then the value of x is

- (a) 1
- (b) 2
- (c) 5
- (d) 9

Answer: (b) 2

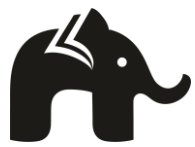
$$3x + 4y = 10 \text{ and } 2x - 2y = 2$$

By elimination method

$$3x + 4y = 10 \quad \dots\dots (i)$$

$$2x - 2y = 2 \quad \dots\dots (ii)$$

Multiplying equation (ii) by 2, we get



$$4x - 4y = 4 \quad \dots\dots (iii)$$

$$3x + 4y = 10 \quad \dots\dots (i)$$

Adding equation (i) and (iii), we get

$$7x = 14$$

$$x = 2$$

Question 6:

Five years ago, Nuri was thrice as old as Sonu. Ten years later, Nuri will be twice as old as Sonu. Then the age of Sonu is

- (a) 20 years
- (b) 30 years
- (c) 40 years
- (d) 50 years

Answer: (a) 20 years

Let the present age of Nuri = x

Let the present age of Sonu = y

According to the given information,

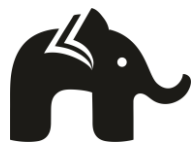
$$(x - 5) = 3(y - 5)$$

$$x - 3y = -10 \quad \dots\dots (i)$$

$$(x + 10y) = 2(y + 10)$$

$$x - 2y = 20 \quad \dots\dots (ii)$$

Subtracting equation (i) from equation (ii), we get



$$y = 20$$

So, the age of Sonu is 20 years.

Question 7:

The given pairs of linear equations $2x + y = 5$, $3x + 2y = 8$, has

- (a) no solution
- (b) unique solution
- (c) infinite many solutions
- (d) None of the above

Answer: (b) unique solution

Given, equations are $2x + y = 5$ and $3x + 2y = 8$

Now, $a_1/a_2 = 2/3$, $b_1/b_2 = 1/2$ and $c_1/c_2 = -5/(-8) = 5/8$

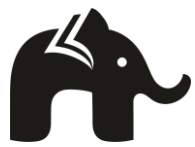
Since $a_1/a_2 \neq b_1/b_2$

Therefore, they will intersect each other at a unique point and thus, there will be a unique solution for these equations.

Question 8:

A fraction becomes $1/3$ when 1 is subtracted from the numerator and it becomes $1/4$ when 8 is added to its denominator. Then the fraction is

- (a) $2/7$
- (b) $3/10$
- (c) $5/12$
- (d) $7/15$



Answer: (c) 5/12

Let the fraction be x/y

According to the question,

$$(x - 1)/y = 1/3$$

$$\Rightarrow 3(x - 1) = y$$

$$\Rightarrow 3x - y = 3 \quad \dots\dots (i)$$

$$x/(y + 8) = 1/4$$

$$\Rightarrow 4x = y + 8$$

$$\Rightarrow 4x - y = 8 \quad \dots\dots (ii)$$

Subtracting equation (i) from equation (ii), we get

$$x = 5 \quad \dots\dots (iii)$$

Putting this value in equation (i), we get

$$15 - y = 3$$

$$y = 12$$

Hence, the fraction is $5/12$.

Question 9:

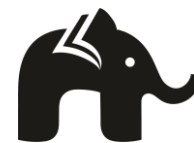
If $1/2x + 1/3y = 2$ and $1/3x + 1/2y = 13/6$, then the value of x is

(a) $1/2$

(b) $1/3$

(c) $-1/2$

(d) $-1/3$



Answer: (a) $1/2$

Given, $1/2x + 1/3y = 2$

and $1/3x + 1/2y = 13/6$

Let $1/x = p$ and $1/y = q$, then the equations changes as below:

$$p/2 + q/3 = 2$$

$$3p + 2q = 12 \quad \dots\dots (i)$$

$$p/3 + q/2 = 13/6$$

$$2p + 3q = 13 \quad \dots\dots (ii)$$

Multiply equation (i) by 3 and equation (ii) by 2 and subtract them, we get

$$\Rightarrow (9p + 6q) - (4p + 6q) = 36 - 26$$

$$\Rightarrow 9p + 6q - 4p - 6q = 10$$

$$\Rightarrow 5p = 10$$

$$\Rightarrow p = 2$$

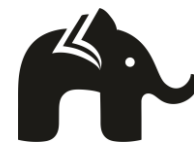
$$\Rightarrow 1/x = 2$$

$$\Rightarrow x = 1/2$$

Question 10:

The value of k for which the lines $5x+7y=3$ and $15x + 21y = k$ coincide is

- (a) 9
- (b) 5
- (c) 7
- (d) 18



Answer: (a) 9

Given, equations are: $5x + 7y = 3$ and $15x + 21y = k$

Lines are coincide when

$$a_1/a_2 = b_1/b_2 = c_1/c_2$$

$$\Rightarrow 5/15 = 7/21 = 3/k$$

$$\Rightarrow 1/3 = 1/3 = 3/k$$

$$\Rightarrow 1/3 = 3/k$$

$$\Rightarrow k = 9$$

Question 11:

A pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ has infinite many solutions if

- (a) $a_1/a_2 \neq b_1/b_2$
- (b) $a_1/a_2 = b_1/b_2 \neq c_1/c_2$
- (c) $a_1/a_2 = b_1/b_2 = c_1/c_2$
- (d) $a_1/a_2 = b_1/b_2$

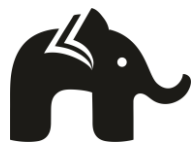
Answer: (c) $a_1/a_2 = b_1/b_2 = c_1/c_2$

A pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ has infinite many solutions when $a_1/a_2 = b_1/b_2 = c_1/c_2$

Question 12:

The pair of equations $y = 0$ and $y = -7$ has

- (a) One solution
- (b) Two solutions



- (c) Infinitely many solutions
- (d) No solution

Answer: (d) No solution

The graph of equations will be parallel lines.

So, the equations have no solution.

Question 13:

One equation of a pair of dependent linear equations is $-5x + 7y - 2 = 0$. The second equation can be

- (a) $10x + 14y + 4 = 0$
- (b) $-10x - 14y + 4 = 0$
- (c) $-10x + 14y + 4 = 0$
- (d) $10x - 14y = -4$

Answer: (d) $10x - 14y = -4$

For dependent pair, the two lines must have

$$a_1/a_2 = b_1/b_2 = c_1/c_2$$

For option (d)

$$a_1/a_2 = b_1/b_2 = c_1/c_2 = -1/2$$

Question 14:

The lines $x = a$ and $y = b$, are

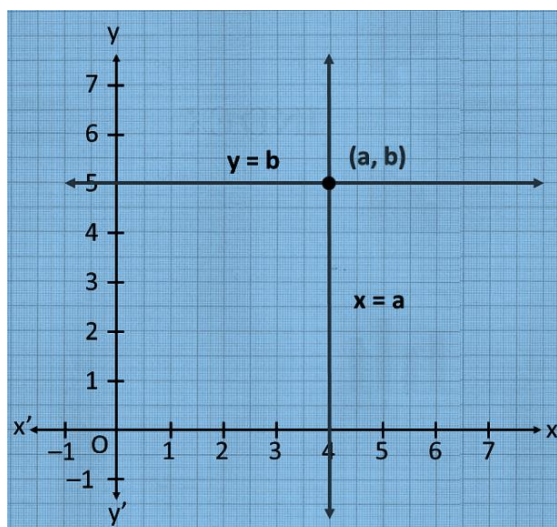
- (a) intersecting
- (b) parallel
- (c) overlapping



(d) (None of these)

Answer: (a) intersecting

When we draw the lines $x = a$ and $x = b$ on the graph, we see that it is intersecting lines.



Question 15:

If $x + 5y = 34$ and $x - 5y = -6$, then the value of $5y - 2x$ is

- (a) -8
- (b) 14
- (c) 8
- (d) 20

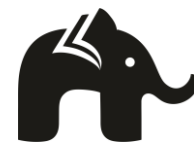
Answer: (a) -8

Given, $x + 5y = 34$ 1

and $x - 5y = -6$ 2

Adding both the equations we get

$$\Rightarrow 2x = 28$$



$$\Rightarrow x = 14$$

Now, from equation 1, we get

$$14 + 5y = 34$$

$$\Rightarrow 5y = 34 - 14$$

$$\Rightarrow 5y = 20$$

$$\Rightarrow y = 4$$

$$\text{So, } 5y - 2x = 5 * 4 - 2 * 14 = 20 - 28 = -8$$

Question 16:

The value of a for which (3, a) lies on $2x - 3y = 5$, is

- (a) $1/3$
- (b) 3
- (c) $-1/3$
- (d) None of these

Answer: (a) $1/3$

Given, (3, a) lies on $2x - 3y = 5$

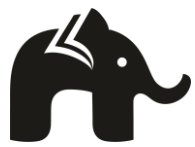
$$\Rightarrow 2 * 3 - 3 * a = 5$$

$$\Rightarrow 6 - 3a = 5$$

$$\Rightarrow -3a = 5 - 6$$

$$\Rightarrow -3a = -1$$

$$\Rightarrow a = 1/3$$



Question 17:

If $ax + by = c$ and $lx + my = n$ has unique solution then the relationship between the coefficients will be of the forms

- (a) $am \neq lb$
- (b) $am = lb$
- (c) $ab = lm$
- (d) $ab \neq lm$

Answer: (a) $am \neq lb$

Given, equations are: $ax + by = c$ and $lx + my = n$

For unique solution, the two lines must have

$$a_1/a_2 \neq b_1/b_2$$

$$\Rightarrow a/l \neq b/m$$

$$\Rightarrow am \neq lb$$

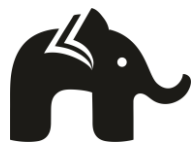
Question 18:

Which of the following is not a solution of pair of equations $3x - 2y = 4$ and $6x - 4y = 8$?

- (a) $x = 2, y = 1$
- (b) $x = 6, y = 7$
- (c) $x = 4, y = 4$
- (d) $x = 5, y = 3$

Answer: (d) $x = 5, y = 3$

Given, equations are: $3x - 2y = 4$ and $6x - 4y = 8$



When $x = 5, y = 3$

$$3x - 2y = 3 * 5 - 2 * 3$$

$$= 15 - 6$$

$$= 9 \neq 4$$

So, $x = 5, y = 3$ is not the solution of given equations.

Question 19:

10 students of class X took part in a Mathematics quiz. If the number of girls is 4 more than the number of boys, then the number of boys who took part in the quiz, is

- (a) 3
- (b) 7
- (c) 2
- (d) 8

Answer: (a) 3

Let number of boys = x

And number of girls = y

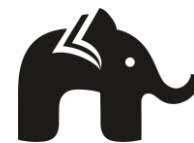
Given, total number of students = 10

$$\Rightarrow x + y = 10 \quad \dots\dots\dots 1$$

Again, number of girls is 4 more than the number of boys

$$\Rightarrow y = x + 4$$

Put the value of y in equation 1, we get



$$\Rightarrow x + x + 4 = 10$$

$$\Rightarrow 2x + 4 = 10$$

$$\Rightarrow 2x = 10 - 4$$

$$\Rightarrow 2x = 6$$

$$\Rightarrow x = 3$$

So, the number of boys = 3

Question 20:

If $217x + 131y = 913$, $131x + 217y = 827$, then $x + y$ is

- (a) 5
- (b) 6
- (c) 7
- (d) 8

Answer: (a) 5

Given, equations are:

$$217x + 131y = 913 \quad \text{.....1}$$

$$131x + 217y = 827 \quad \text{.....2}$$

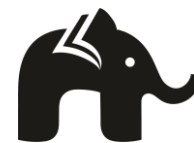
Adding equations 1 and 2, we get

$$(217x + 131y) + (131x + 217y) = 913 + 827$$

$$\Rightarrow (217x + 131x) + (131y + 217y) = 1740$$

$$\Rightarrow 348x + 348y = 1740$$

$$\Rightarrow 348(x + y) = 1740$$



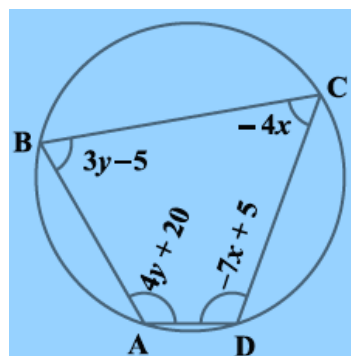
$$\Rightarrow x + y = 1740/348$$

$$\Rightarrow x + y = 5$$

Question 21:

ABCD is a cyclic quadrilateral as shown in the figure. The value of angle C is

- (a) 120°
- (b) 110°
- (c) 60°
- (d) 50°



Answer: (c) 60°

We know that the sum of the measures of opposite angles in a cyclic quadrilateral is 180°.

Therefore, $\angle A + \angle C = 180^\circ$

$$4y + 20 - 4x = 180^\circ$$

$$\Rightarrow -4x + 4y = 160^\circ$$

$$\Rightarrow x - y = -40^\circ \quad \text{.....(i)}$$

Also, $\angle B + \angle D = 180^\circ$

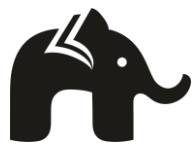
$$3y - 5 - 7x + 5 = 180^\circ$$

$$\Rightarrow -7x + 3y = 180^\circ \quad \text{.....(ii)}$$

Multiplying equation (i) by 3, we obtain

$$3x - 3y = -120^\circ \quad \text{.....(iii)}$$

Adding equations (ii) and (iii), we obtain



$$-7x + 3x = 180^\circ - 120^\circ$$

$$\Rightarrow -4x = 60^\circ$$

$$\Rightarrow x = -15^\circ$$

$$\text{Now, } \angle C = -4x = -4(-15^\circ) = 60^\circ$$

Question 22:

In a $\triangle ABC$, $\angle A = x^\circ$, $\angle B = (3x - 2)^\circ$ and $\angle C = y^\circ$. Also, $\angle C - \angle B = 9^\circ$. Then the value of $\angle B$ is

- (a) 73°
- (b) 82°
- (c) 25°
- (d) 49°

Answer: (a) 73°

In a triangle, sum of all three angles equals to 180° .

$$\text{So, } \angle A + \angle B + \angle C = 180$$

$$\Rightarrow x + 3x - 2 + y = 180$$

$$\Rightarrow 4x + y = 180 + 2$$

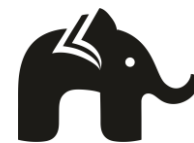
$$\Rightarrow 4x + y = 182 \quad \dots\dots\dots 1$$

$$\text{Also, } \angle C - \angle B = 9^\circ$$

$$\Rightarrow y - (3x - 2) = 9$$

$$\Rightarrow y - 3x + 2 = 9$$

$$\Rightarrow y - 3x = 9 - 2$$



$$\Rightarrow y - 3x = 7 \quad \dots\dots\dots 2$$

Subtracting equations 1 and 2, we get

$$(4x + y) - (y - 3x) = 182 - 7$$

$$\Rightarrow 4x + y - y + 3x = 175$$

$$\Rightarrow 7x = 175$$

$$\Rightarrow x = 25$$

$$\text{Now, } \angle B = (3x - 2)^\circ$$

$$= (3 * 25 - 2)^\circ$$

$$= (75 - 2)^\circ$$

$$= 73^\circ$$

Question 23:

The number of solutions of $3^{x+y} = 243$ and $243^{x-y} = 3$ is

- (a) 0
- (b) 1
- (c) 2
- (d) infinite

Answer: (b) 1

$$\text{Given, } 3^{x+y} = 243$$

$$\Rightarrow 3^{x+y} = 3^5$$

$$\Rightarrow x + y = 5 \quad \dots\dots\dots 1 \quad [\text{If } a^x = a^y \text{ then } x = y]$$

$$\text{And } 243^{x-y} = 3$$



Class 10 Maths | Linear Equations in Two Variables | MCQs

$$\Rightarrow (3^5)^{x-y} = 3^1$$

$$\Rightarrow 3^{5(x-y)} = 3^1$$

$$\Rightarrow 5(x-y) = 1 \quad [\text{If } a^x = a^y \text{ then } x = y]$$

$$\Rightarrow x - y = 1/5 \quad \dots\dots\dots 2$$

Adding equations 1 and 2, we get

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

$$\Rightarrow 2x = 26/5$$

$$\Rightarrow x = 13/5$$

From equation 1, we get

$$13/5 + y = 5$$

$$\Rightarrow y = 5 - 13/5$$

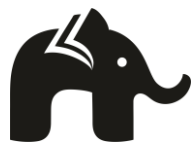
$$\Rightarrow y = (25 - 13)/5$$

$$\Rightarrow y = 12/5$$

Thus, $x = 13/5$, $y = 12/5$

Since only one pair of solution are there

So, the number of solution = 1



Case Study Based Questions

Question 24:

A test consists of 'True' or 'False' questions. One mark is awarded for every correct answer while $\frac{1}{4}$ mark is deducted for every wrong answer. A student knew answers to some of the questions. Rest of the questions he attempted by guessing. He answered 120 questions and got 90 marks.

Types of questions	Marks given for correct answer	Marks deducted for wrong answer
True/False	1	0.25

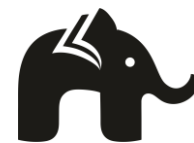
(i). If answer to all questions he attempted by guessing were wrong, then how many questions did he answer correctly?

- (a) 24
- (b) 46
- (c) 66
- (d) 96

(ii). How many questions did he guess?

- (a) 10
- (b) 15
- (c) 19
- (d) 24

(iii). If answer to all questions he attempted by guessing were wrong and answered 80 correctly, then how many marks he got?



- (a) 20
- (b) 50
- (c) 70
- (d) 95

(iv). If answer to all questions he attempted by guessing were wrong, then how many questions answered correctly to score 95 marks?

- (a) 25
- (b) 50
- (c) 75
- (d) 100

Answer:

(i). (d) 96

Let the number of questions whose answer he knew = x

And the number of questions attempted by cheating = y

Given, total number of question attempted = 120

$$\Rightarrow x + y = 120 \quad \dots\dots\dots 1$$

Again, answer to all questions he attempted by guessing were wrong.

Marks from all guessed answers = $y * (-0.25) = y * (-1/4)$

Marks from all attempted answers = $x * 1$

Now, total marks = 90

$$\Rightarrow x - y/4 = 90$$

$$\Rightarrow (4x - y)/4 = 90$$

$$\Rightarrow 4x - y = 360 \quad \dots\dots\dots 2$$

Solving equations 1 and 2, we get

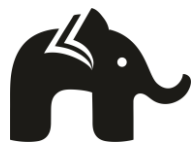
$$x = 96, y = 24$$

So, the number of questions he answered correctly = $x = 96$

(ii). (d) 24

Number of questions he guessed = $y = 24$

(iii). (c) 70



Given, total questions = 120

Questions answered correctly = 90

So, questions answered by guessing = $120 - 80 = 40$

$$\begin{aligned}\text{Now, total marks} &= \text{Question answered correctly} * 1 - (1/4) * \text{questions} \\ &\quad \text{answered incorrectly} \\ &= 80 * 1 - (1/4) * 40 \\ &= 80 - 10 \\ &= 70\end{aligned}$$

Thus, he got 70 marks.

(iv). (d) 100

Given, total questions = 120

Let questions answered correctly = x

So, question answered by guessing = $120 - x$

Now, total marks = Question answered correctly * 1 - (1/4) * questions answered incorrectly

$$\Rightarrow 95 = x * 1 - (120 - x) * 1/4$$

$$\Rightarrow 95 = \{4x - (120 - x)\}/4$$

$$\Rightarrow 95 * 4 = 4x - 120 + x$$

$$\Rightarrow 380 = 5x - 120$$

$$\Rightarrow 5x = 380 + 120$$

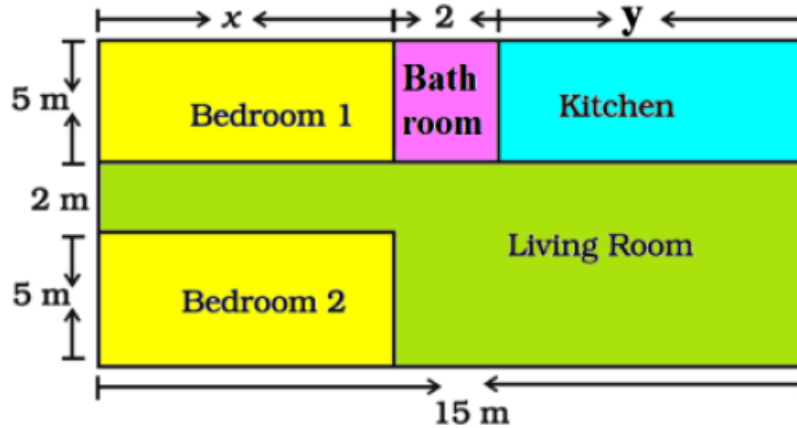
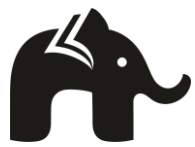
$$\Rightarrow 5x = 500$$

$$\Rightarrow x = 100$$

So, he answered 100 questions correctly.

Question 25:

Amit is planning to buy a house and the layout is given below. The design and the measurement has been made such that areas of two bedrooms and kitchen together is 95 sq.m.



(i). Formation of the pair of linear equations in two variables from this situation is

- (a) $x + y = 13, 2x + y = 19$
- (b) $x + y = 15, 2x + y = 17$
- (c) $x + y = 17, 2x + y = 19$
- (d) $x + y = 19, 2x + y = 21$

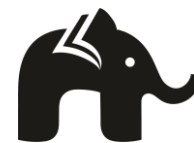
(ii). Find the length of the outer boundary of the layout.

- (a) 20 m
- (b) 34 m
- (c) 46 m
- (d) 54 m

(iii). Find the area of each bedroom and kitchen in the layout.

- (a) $20 \text{ m}^2, 35 \text{ m}^2$
- (b) $30 \text{ m}^2, 45 \text{ m}^2$
- (c) $20 \text{ m}^2, 45 \text{ m}^2$
- (d) $30 \text{ m}^2, 35 \text{ m}^2$

(iv). Find the area of living room in the layout.



- (a) 25 m^2
- (b) 50 m^2
- (c) 75 m^2
- (d) 100 m^2

(v). Find the cost of laying tiles in kitchen at the rate of Rs. 50 per sq.m.

- (a) Rs 1150
- (b) Rs 1350
- (c) Rs 1550
- (d) Rs 1750

Answer:

(i). (a) $x + y = 13$, $2x + y = 19$

Given, length = 15 m

$$\Rightarrow x + 2 + y = 15$$

$$\Rightarrow x + y = 13 \quad \dots\dots\dots 1$$

Also given, area of two bedrooms + kitchen = 95 sq. m

$$\Rightarrow 2(5 * x) + 5 * y = 95$$

$$\Rightarrow 10x + 5y = 95$$

$$\Rightarrow 2x + y = 19 \quad \dots\dots\dots 2$$

(ii). (d) 54 m

Length of outer boundary of layout = perimeter of rectangle

$$= 2(\text{length} + \text{breadth})$$

$$= 2(12 + 15)$$

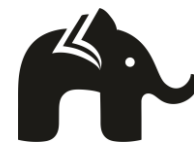
$$= 2 * 27$$

$$= 54 \text{ m}$$

(iii). (d) 30 m^2 , 35 m^2

To find the area, we have to solve the equations

$$x + y = 13 \quad \dots\dots\dots 1$$



$$2x + y = 19 \quad \dots\dots\dots 2$$

From the equation 1, we get

$$y = 13 - x \quad \dots\dots\dots 3$$

Put value of y in equation 2, we get

$$2x + 13 - x = 19$$

$$\Rightarrow x = 19 - 13$$

$$\Rightarrow x = 6$$

From equation 3, we get

$$y = 13 - 6 = 7$$

Now, area of bedroom = $5 * x = 5 * 6 = 30 \text{ m}^2$

and area of kitchen = $5 * y = 5 * 7 = 35 \text{ m}^2$

(iv). (c) 75 m^2

Area of living room = Area of $15 * 7$ rectangle – area of bedroom

$$= (15 * 7) - 30$$

$$= 105 - 30$$

$$= 75 \text{ m}^2$$

(v). (d) Rs 1750

Area of kitchen = 35 m^2

Given, cost of laying 1 m^2 tile in the kitchen = Rs 50

So, cost of laying 35 m^2 tile in the kitchen = $\text{Rs } 50 * 35 = \text{Rs } 1750$
