No. 1

4. Linear Equations In Two Variables

AN EQUATION WITH

ATICAL STATEMENT WITH
ARIABLE AND AN '=' SIGN

Degree 1

HIGHEST POWER OF VARIABLE

$x^1 + 3 = 0$

$y^1 + 3 = 0$

IS IT AN EQUATION?

$+ 3 = 0$

$+ 9 = 0$

IS IT AN EQUATION?

IS IT AN EQUATION?

$y^1 + 9 = 0$

Standard Form of Linear Equation i 2 variables:-

THERE CO-EFFICIENT

$$ax + by + c = 0$$

Real numbers

$a \neq 0$ and $b \neq 0$

No. 2

Q. The cost of a notebook is twice the cost of a pen.
Write a linear equation in two variables to represent this statement.

Sol. Let the cost of notebook be Rs. x , Let the cost of pen be Rs.y ,

$\therefore \quad x = 2y$

Q. Express the following linear equations in the form $ax + by + c = 0$ and indicate the values of a, b, and c in each case.

(i) $2x + 3y = 9$

Sol. $2x + 3y = 9$

$\therefore\ 2x + 3y - 9 = 0$

On comparing with $ax + by + c = 0$, we have,

$a = 2,\quad b = 3,\quad c = -9$

Constant → R.H.S
9 → -9

Comparing eqⁿ with
ax + by + c = 0

(ii) $x - \frac{y}{5} - 10 = 0$

Sol. $x - \frac{y}{5} - 10 = 0$

Multiplying throughout by 5

$\therefore\ x \times 5 - \frac{y}{5} \times 5 - 10 \times 5 = 0 \times 5$

$\therefore\ 5x - y - 50 = 0$

On comparing with $ax + by + c = 0$, we have,

$a = 5,\quad b = -1,$ and $c = -50$

Comparing eqⁿ with
ax + by + c = 0

Constant → R.H.S
9 → -9

Comparing eqⁿ with
ax + by + c = 0

Sol. $-2x + 3y = 6$

$2x + 3y - 6 = 0$

On comparing with $ax + by + c = 0$, we have,

$a = -2,\quad b = 3,\quad c = -6$

Constant → R.H.S
6 → -6

Sol. $x = 3y$

$\therefore\ x - 3y = 0$

On comparing with $ax + by + c = 0$, we have,

$a = 1,\quad b = -3,$ and $c = 0$

To get rid of the denominator multiply equation with

Comparing eqⁿ with
ax + by + c = 0

Q. Express the following linear equations in the form $ax + by + c = 0$ and indicate the values of a, b, and c in each case.

(v) $2x = -5y$

Sol. $2x = -5y$

$\therefore$ $2x + 5y + 0 = 0$

On comparing with $ax + by + c = 0$, we have,

$a = 2$, $b = 5$, and $c = 0$.

Comparing eqⁿ with $ax + by + c = 0$

(vi) $3x + 2 = 0$

Sol. $3x + 2 = 0$

$\therefore$ $3x + 0y + 2 = 0$

On comparing with $ax + by + c = 0$, we have,

$a = 3$, $b = 0$, and $c = 2$.

Comparing eqⁿ with $ax + by + c = 0$

(vii) $5 = 2x$

Sol. $5 = 2x$

$\therefore$ $-2x + 0y + 5 = 0$

On comparing with $ax + by + c = 0$, we have,

$a = -2$, $b = 0$, and $c = 5$.

Comparing eqⁿ with $ax + by + c = 0$

No. 3

Q. Which one of the following options is true, and why?

(i) a unique solution, (ii) only two solutions,

(iii) infinitely many solutions

Sol. $y = 3x + 5$

For $y = 0$

$\therefore 3x + 5 = 0$

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

$\therefore \left(\frac{-5}{3}, 0\right)$ Is one of the solution

For $x = 0$

Given equation is

$\therefore y = 3x + 5$

$\therefore y = 3(0) + 5$

Constant → R.H.S

$\therefore y = 0 + 5$

$\therefore y = 5$

$\therefore$ (0,5) is another solution

For $x = 1$

$\therefore y = 3x + 5$

$\therefore y = 3(1) \times 1 + 5$

$\therefore y = 3 + 5$

$\therefore y = 8$

$\therefore$ (1,8) is another solution

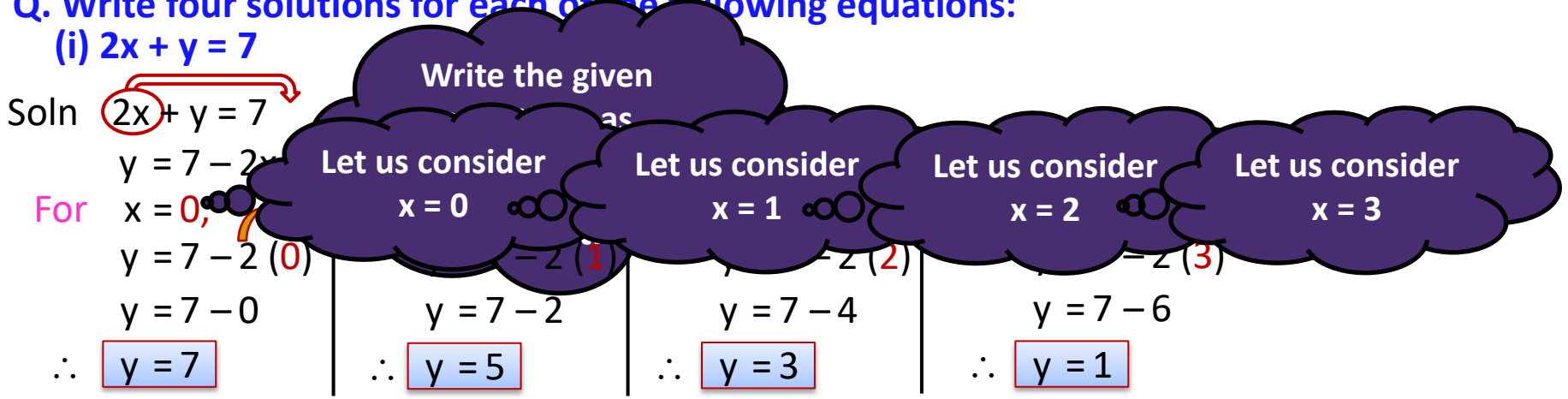
$\therefore$ A linear eq

Thus, the chosen value of x together with this value of y constitutes another solution of the given solution

So, there is no end to different solutions of a linear equation in two variables.

Q. Write four solutions for each of the following equations:

(i) $2x + y = 7$



Soln $2x + y = 7$

$y = 7 - 2x$

For $x = 0$, $y = 7 - 2(0)$, $y = 7 - 0$, $\therefore y = 7$

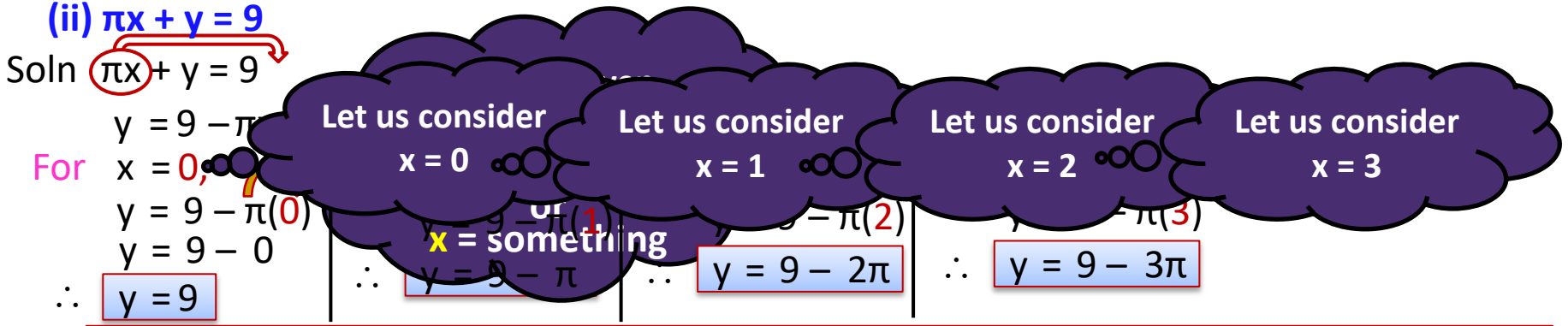
$y = 7 - 2(1)$, $y = 7 - 2$, $\therefore y = 5$

$y = 7 - 2(2)$, $y = 7 - 4$, $\therefore y = 3$

$y = 7 - 2(3)$, $y = 7 - 6$, $\therefore y = 1$

$\therefore$ **The four solutions of the given equation are (0, 7), (1, 5), (2, 3) and (3, 1).**

(ii) $\pi x + y = 9$



Soln $\pi x + y = 9$

$y = 9 - \pi x$

For $x = 0$, $y = 9 - \pi(0)$, $y = 9 - 0$, $\therefore y = 9$

$y = 9 - \pi(1)$, $y = 9 - \pi$

$y = 9 - \pi(2)$, $y = 9 - 2\pi$

$y = 9 - \pi(3)$, $y = 9 - 3\pi$

$\therefore$ **The four solution of the given equation are (0, 9), (1, 9 – π), (2, 9 – 2π)and (3, 9 – 3π).**

(iii) x = 4y

Soln $x = 4y$

$x = 4y$

For $y = 0$, $x = 4(0)$

$\therefore x = 0$

Write the given as

Let us consider $y = 0$

Let us consider $y = 1$

$x = 4(1)$

$\therefore x = 4$

Let us consider $y = 2$

$x = 4(2)$

$\therefore x = 8$

Let us consider $x = 3$

$x = 4(3)$

$\therefore x = 12$

$\therefore$ **The four solutions of the given equation are (0, 0), (1, 4) (2, 8) and (3, 12).**

No. 4

Q. Check which of the following are solutions of the equation x – 2y = 4 and which are not:

(i) (0, 2)

Soln. **x – 2y = 4**

Putting x = 0, y = 2 in the L.H.S of x - 2y = 4,

We have,

$\therefore$ L.H.S = 0 - 2 (2)

= - 4

$\therefore$ L.H.S $\neq$ R.H.S

$\therefore$ **x = 0, y = 2 is not its solution.**

(iii) (4, 0)

Soln. **x – 2y = 4**

Putting x = 4, y = 0 in the L.H.S of x - 2y = 4,

We have,

$\therefore$ L.H.S = 4 - 2 (0)

= 4

$\therefore$ L.H.S = R.H.S

$\therefore$ **x = 4, y = 0 is its solution.**

(v) (1, 1)

Soln. $x - 2y = 4$

Putting $x = 1$, $y = 1$ in the L.H.S of $x - 2y = 4$,

We have,

$\therefore$ L.H.S $= 1 - 2(1)$

$= 1 - 2$

$= -1$

$\therefore$ L.H.S $\neq$ R.H.S

$\therefore$ **$x = 1, y = 1$ is not its solution.**

(iv) $(\sqrt{2}, 4\sqrt{2})$

Soln. $x - 2y = 4$

Putting $x = \sqrt{2}$, $y = 4\sqrt{2}$ in the L.H.S of $x - 2y = 4$,

We have,

$\therefore$ L.H.S $= \sqrt{2} - 2(4\sqrt{2})$

$= \sqrt{2} - 8\sqrt{2}$

$= -7\sqrt{2}$

$\therefore$ L.H.S $\neq$ R.H.S

$\therefore$ **$x = \sqrt{2}, y = 4\sqrt{2}$ is not its solution.**

Q. Find the value of k, if x = 2, y = 1 is a solution of the equation 2x + 3y = k.

Soln. If x = 2, y = 1 is a solution of the equation 2x + 3y = k, then these values will satisfy the equation.

Putting x = 2, y = 1 in the equation **2x + 3y = k**

We have,

$\therefore$ **2x + 3y = k**

$\therefore$ 2 (2) + 3 (1) = k

$\therefore$ 4 + 3 = k

$\therefore$ k = 7

Thank You

No. 5

Q. Find the value of k, if $x = k^2$, $y = k$ is a solution of the equation $x - 5y + 6 = 0$.

Soln. If $x = k^2$, $y = k$ is a solution of the equation $x - 5y + 6 = 0$, then these values will satisfy the equation.

Putting $x = k^2$, $y = k$ in the equation $x - 5y + 6 = 0$

We have,

$\therefore \quad k^2 - 5k + 6 = 0$

$\therefore \quad k^2 - 3k - 2k + 6 = 0$

$\therefore \quad k(k - 3) - 2(k - 3) = 0$

$\therefore \quad (k - 3)(k - 2) = 0$

$\therefore \quad (k - 3) = 0 \quad \text{or} \quad (k - 2) = 0$

$\therefore \quad k = 3 \quad \text{or} \quad k = 2$

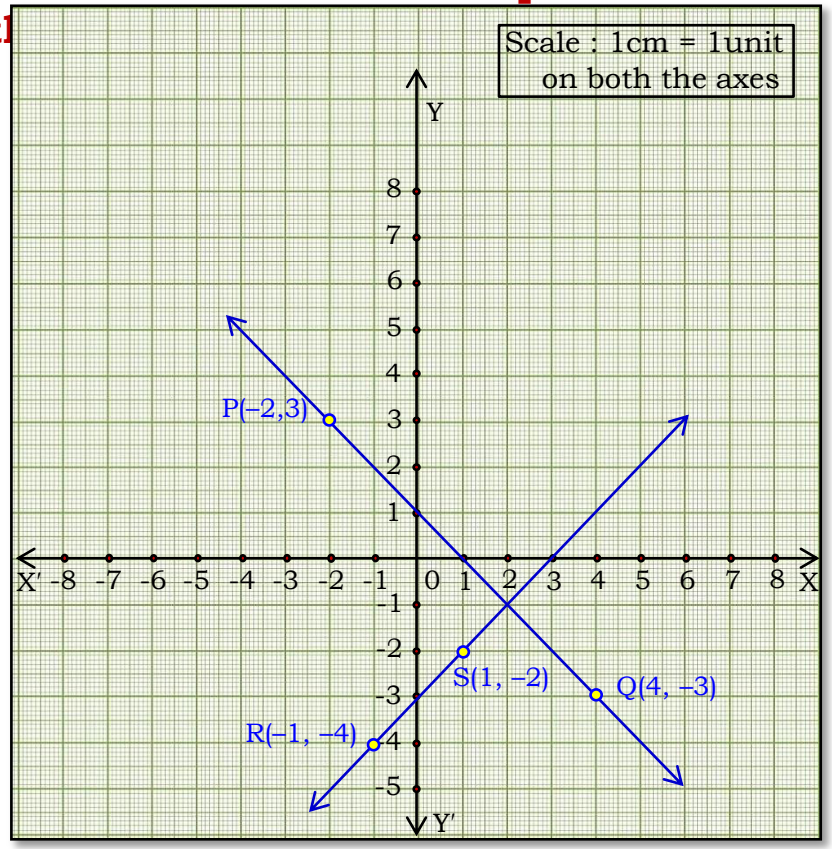
The values of k are 3 and 2.

No. 6

Q. Plot the P (– 2, 3), Q (4, – 3), R (– 1, – 4) and S (1, – 2) on a graph paper. Draw line PQ and line RS and write down the co-ordinates of the point of intersection. Also write co-ordinates of t
Y-axis.

Sol. The co-ordinates of point of intersection of line PQ and line RS is (2, – 1).

The co-ordinates of point where line RS cuts Y-axis is (0, – 3).



Q. Points (2, 4), (– 1, – 2) and (3, 6) lie on a line. Write the equation of that line.

Sol. Let required equation be of the form

$y = ax + b$ .....(i)

Consider (2, 4)

Substituting x = 2 and y = 4 in (i),

$(4) = a \times (2) + b$

$4 = 2a + b$

$2a + b = 4$ .....(ii)

Similarly consider (– 1, – 2)

Substituting x = – 1 and y = – 2 in (i),

$(-2) = a \times (-1) + b$

$-2 = -a + b$

$-a + b = -2$ .....(iii)

Subtracting (iii) from (ii),

$2a + b = 4$

$-a + b = -2$

(+) (–) (+)

$3a = 6$

$\therefore \quad a = \frac{6}{3}$

$\therefore \quad a = 2$

Substituting a = 2 in (ii),

$2 \times 2 + b = 4$

$\therefore \quad 4 + b = 4$

$\therefore \quad b = 4 - 4$

$\therefore \quad b = 0$

Substituting a = 2 and b = 0 in (i),

$y = (2) \times x + (0)$

$y = 2x$

No. 7

Q. Draw the graph of eq… co-ordinates of the point where the graph i…

Sol. $3x + 2y = 6$

$\therefore \quad 2y = 6 - 3x$

$\therefore \quad y = \dfrac{6 - 3x}{2}$

Now which … su…

Write the … e…

Add or subtract denominator to first assumed value to get next assumption

x	0		
y	3		
(x, y)	(0, 3)		

$y = \dfrac{6 - 3}{2}$ $\quad y = \dfrac{6 - }{2}$ $\quad y = \dfrac{6 - 3(-2)}{2}$

$y = \dfrac{6}{2}$ $\quad y = \dfrac{6}{2}$ $\quad y = \dfrac{6 + 6}{2}$

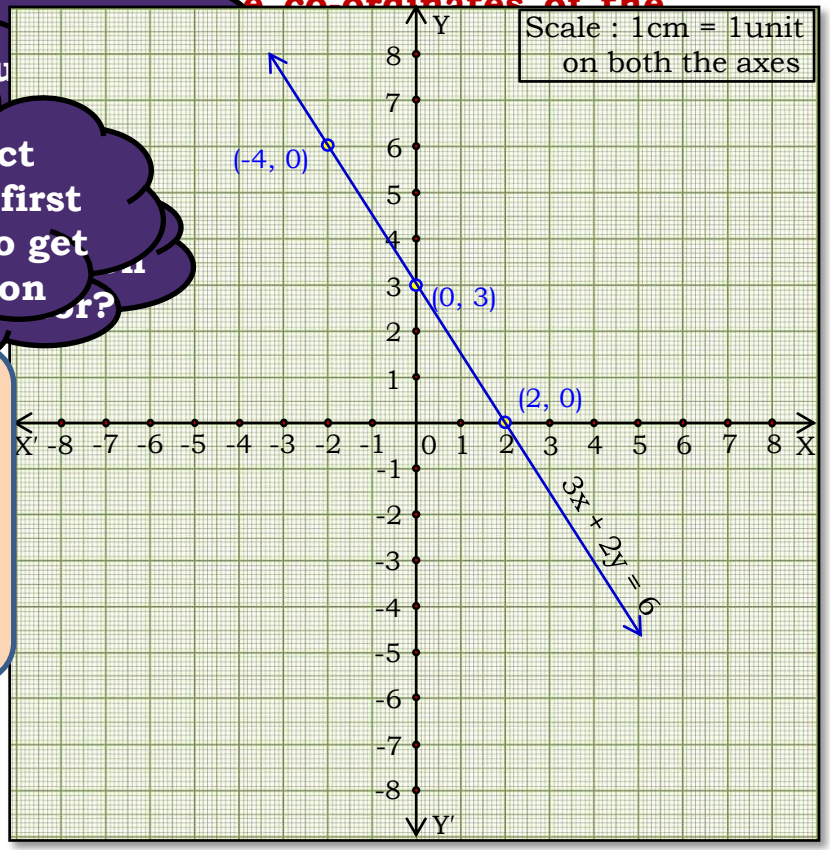
$y = 3$ $\quad y = 0$ $\quad y = 6$

Steps to draw gra…

Arrange equation …

Prepare a table to find co-ordinates of points to be plotted

Plot the points on graph and draw a line passing through them



Q. Draw the graph of equ… the following from the graph (i) the value of y, w… (ii) the valu… of x, whe…

Sol. 2x – 3…

Now which…

…d or subtract …inator to first …d value to get

When y = 3

= 4

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

$x = \frac{5+}{2}$ $x = \frac{8}{2}$

x = 4 x = 7

x	4	
y	1	
(x, y)	(4, 1)	

(i) When x = 4, then y = 1

(ii) When y = 3, then x = 7

Steps to draw grap…

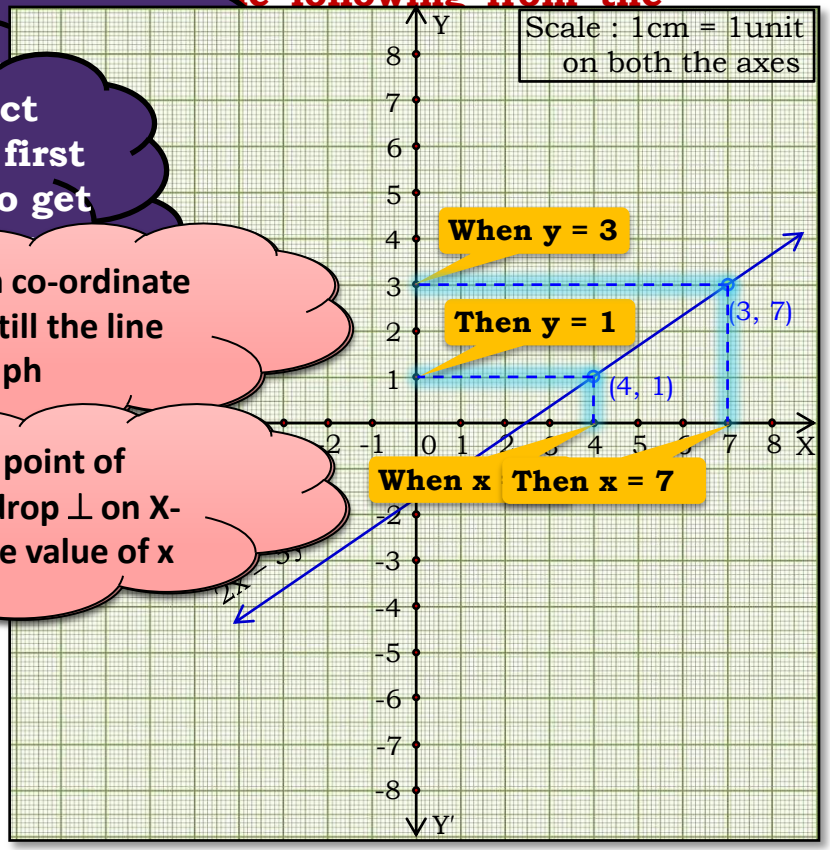
Arrange equation as (x =) or (y =)

Prepare a table to find co-ordinates of points to be plotted

Plot the points on graph and draw a line passing through them

Draw ⊥ from co-ordinate 3 of Y-axis till the line graph

From this point of intersection drop ⊥ on X-axis to get the value of x



Thank You

No. 8

Graph Of Linear Equations Is Represented as a Straight Line

Q. Draw the graph of each of the f… variables :

(i) $x + y = 4$

Sol : $x + y = 4$

$\therefore$ $x = 4 - y$

x	4			
y				
(x, y)				

We have to prepare a table of coordinates

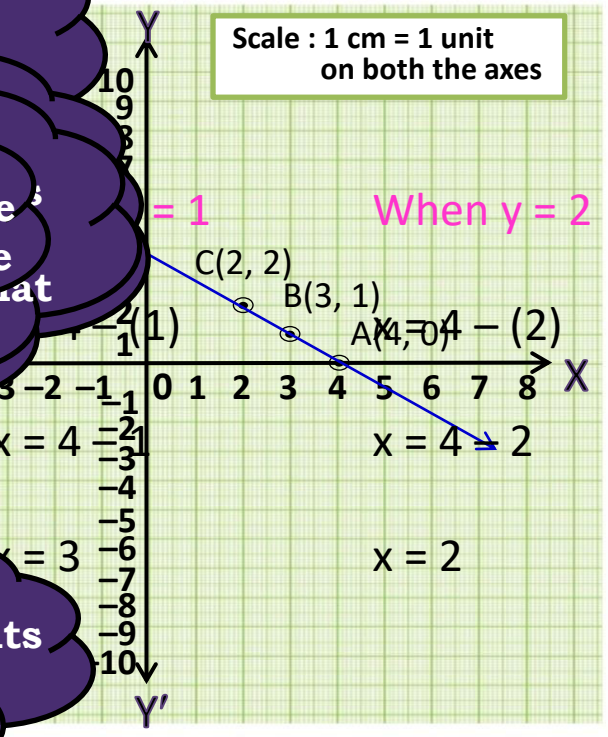
Now let us substitute these Assumed values of y in the Equation x = 4 - y

Write the equ…

Now plot C(2,2)

…passing … These points A, B and C

…points …able on …n paper



No. 9

Q. Draw the graph of each of the f… …variables :

(ii) $x - y = 2$

Sol : $x - y = 2$

$\therefore$ $x = 2 + y$

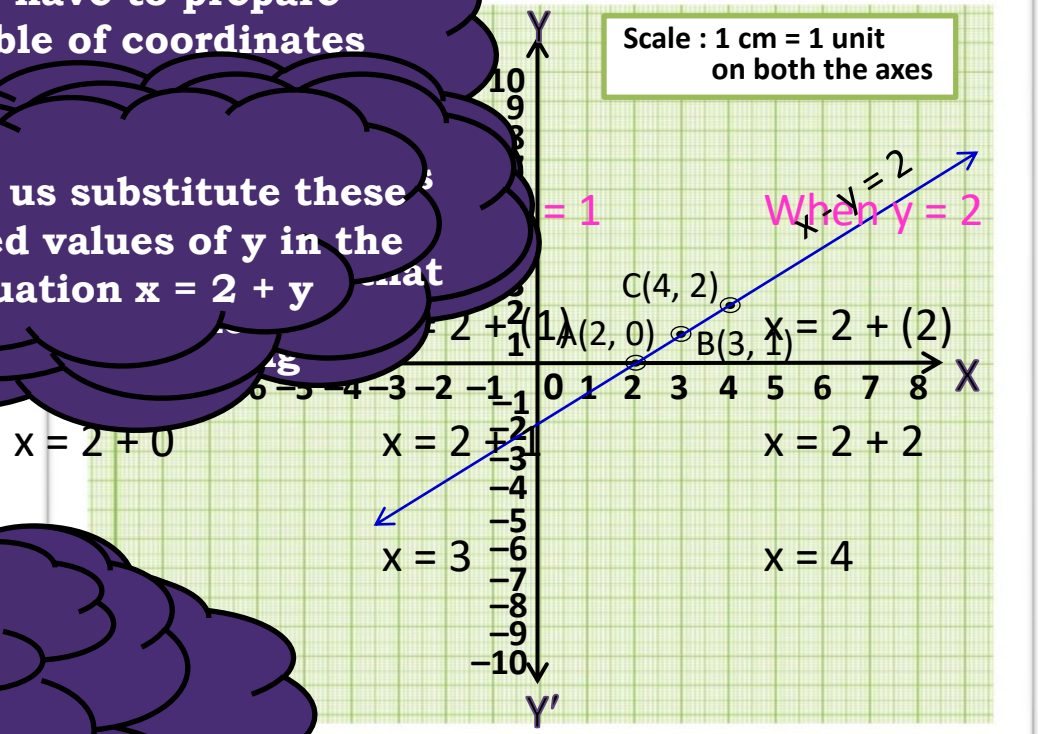
We have to prepare a table of coordinates f…

Now let us substitute these Assumed values of y in the Equation x = 2 + y

x	2	3	4
y	0	1	2
(x, y)	(2, 0)	(3, 1)	(4, 2)

Now plot C(4,2)

line



Q. Draw the graph of each of the following linear equations in two variables :

(iv) $3 = 2x + y$

Sol : $2x + y = 3$

$\therefore \quad y = 3 - 2x$

x	0	1	- 1
y	3	1	
(x, y)	(0, 3)	(1, 1)	(2, -1)

If ... Ther... Var...

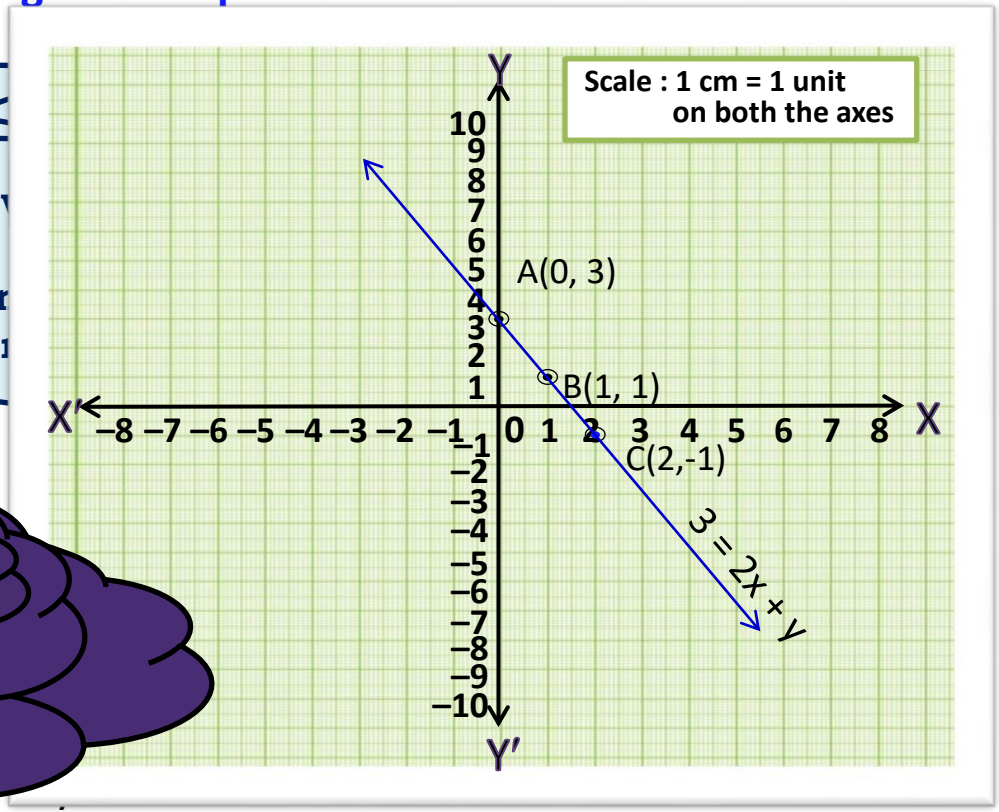
When x ...

y ...

y = 3 ...

y = 3 y = 1 y = -1

Now plot C(2,-1) line



No. 10

Q. Give the equations of two lines passing through (2, 14).
How many more such lines are there, and why?

Soln. **Consider : $7x - y = 0$**

Putting $x = 2$, $y = 14$ in the L.H.S of $7x - y = 0$,

We have,

$\therefore$ L.H.S. $= 7(2) - 14$

$= 0$

$\therefore$ L.H.S $=$ R.H.S

Consider : $x + y = 16$

Putting $x = 2$, $y = 14$ in the L.H.S of $x + y = 16$,

We have,

$\therefore$ L.H.S. $= 2 + 14$

$= 16$

$\therefore$ L.H.S $=$ R.H.S

Required linear equation is $7x - y = 0$. Note that $x + y = 16$, $2x + y = 18$ and $7x + y = 28$ are also satisfied by the co-ordinates of the point (2, 14).

So, any line passing through the point (2, 14) is an example of a linear equation for which (2, 14) is a solution.

$\therefore$ Thus, there are infinite number of lines through (2, 14).

Q. If the point (3, 4) lies on the graph of the equation $3y = ax + 7$, find the value of a?

Soln. Since (3,4) lie on the graph corresponding to $3y = ax + 7$. Therefore, (3,4) satisfies the given equation.

$\therefore \quad 3(4) = a(3) + 7$

$\therefore \quad 12 = 3a + 7$

$\therefore \quad 12 - 7 = 3a$

$\therefore \quad 5 = 3a$

$\therefore \quad 3a = 5$

$\therefore \quad a = \frac{5}{3}$

$\therefore$ **Hence, for $a = \frac{5}{3}$ (3, 4) lies on the graph of equation $3y = ax + 7$.**

No. 11

Q.) Draw the graphs representing the equations 2x + y = 6 and 2x – y + 2 = 0 on the same graph paper. Find the area of the triangle formed by these lines and X-axis.

Sol : $2x + y = 6$

$\therefore \quad y = 6 - 2x$

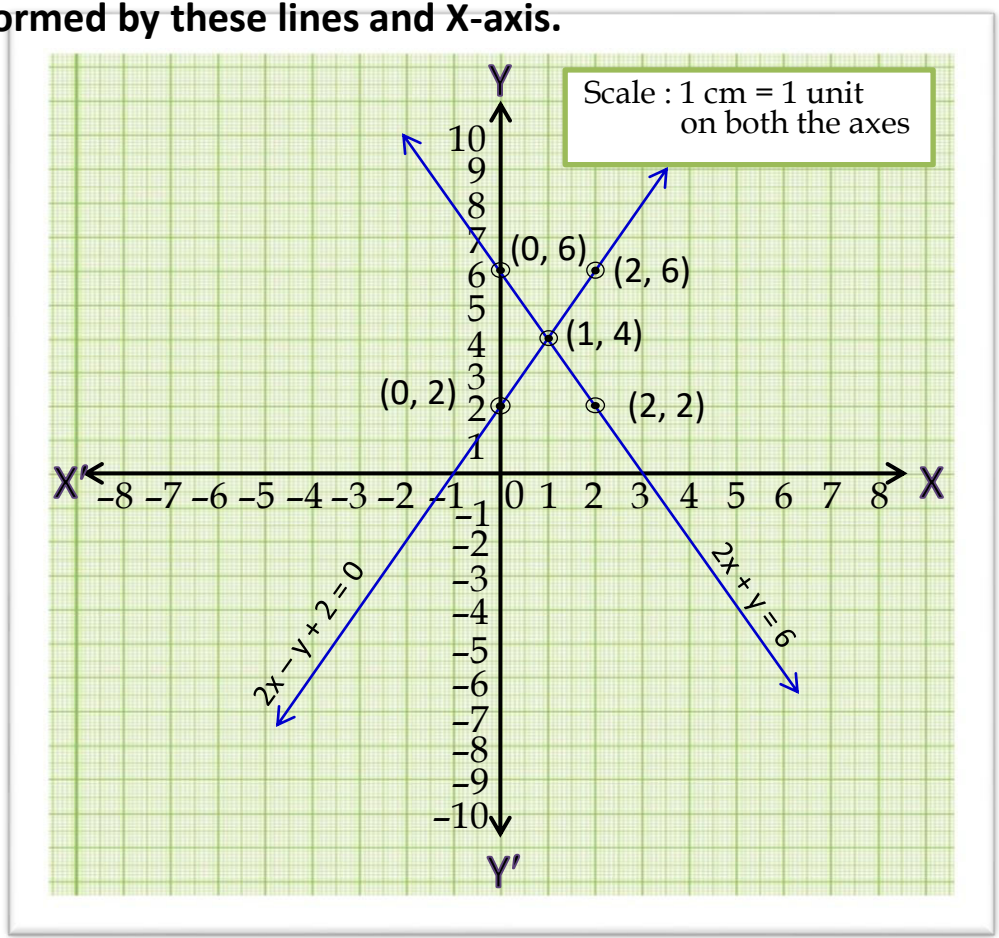
x	0	1	2
y	6	4	2
(x, y)	(0, 6)	(1, 4)	(2, 2)

$2x - y + 2 = 0$

$\therefore \quad 2x + 2 = y$

$\therefore \quad y = 2x + 2$

x	0	1	2
y	2	4	6
(x, y)	(0,2)	(1,4)	(2,6)



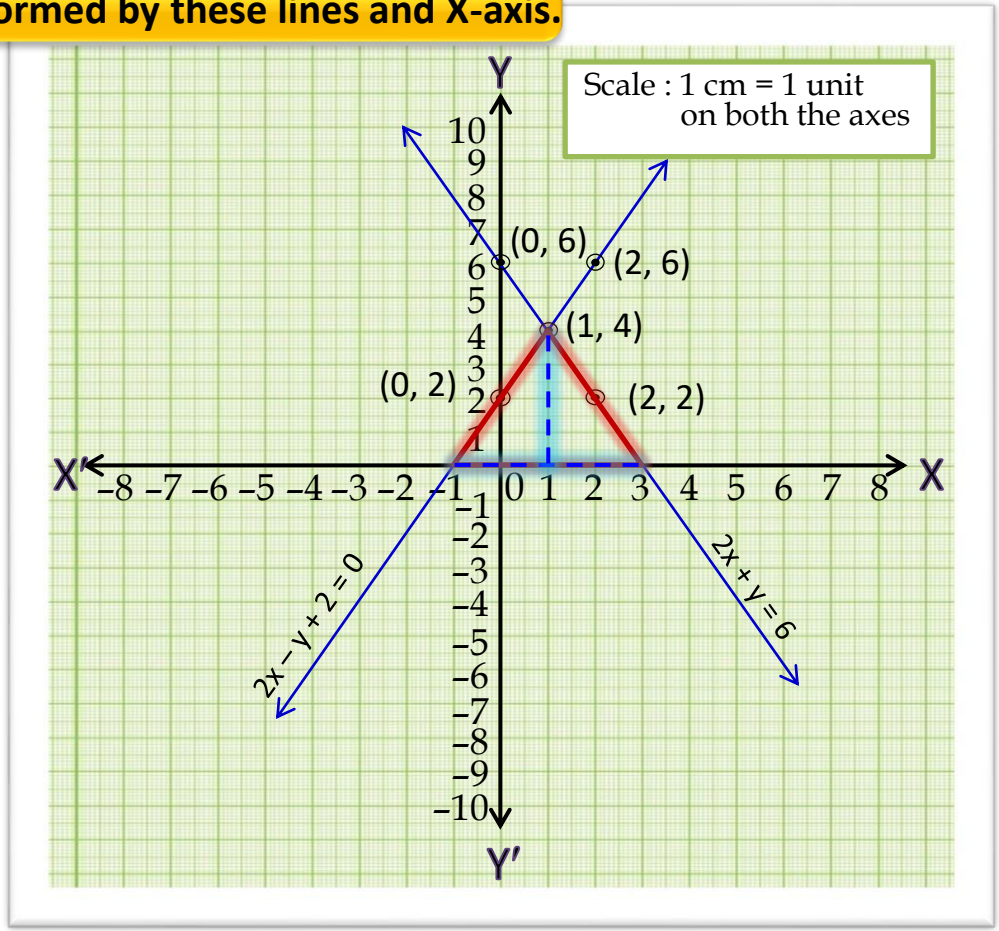
Q.) Draw the graphs representing the equations 2x + y = 6 and 2x – y + 2 = 0 on the same graph paper. Find the area of the triangle formed by these lines and X-axis.

Sol :

Area of the triangle $= \frac{1}{2} \times b \times h$

$\therefore$ Area $= \frac{1}{2} \times 4 \times 4$

$\therefore$ Area $= 8$ sq.cm



No. 12

Q. Frame linear equations in two variables representing the following information :

(i) The sum of two numbers is 1 … nce is 25.

Sol. Let the two numbers be x and y

According to the first condition,

$x + y = 125$ .....(i)

By second condition,

$x - y = 25$ .....(ii)

(ii) Difference between two complementary angles is 6.

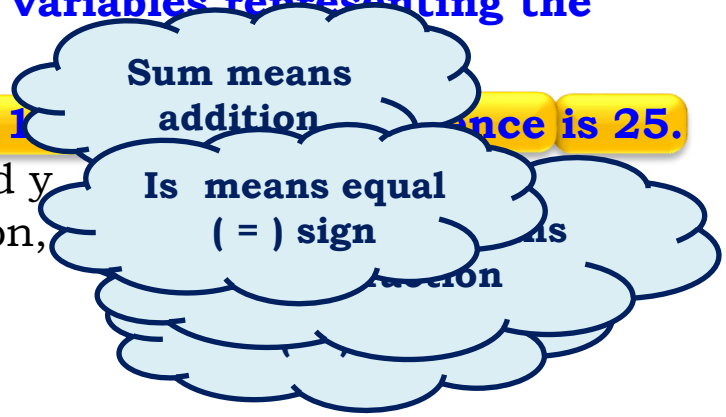
Sol. Let the two complementary angles be x° and …°

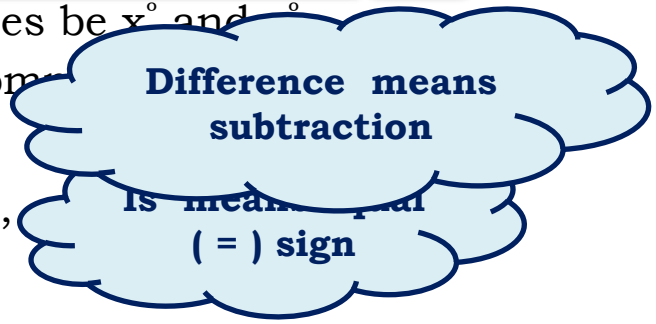
We know that the sum of two com…

$\therefore \quad x + y = 90$ .....(i)

According to the given condition,

$x - y = 6$ .....(ii)





(iii) **Sum of the ages of Monali and Sonali is 29 years. Monali is younger than Sonali by 3 years.**

Sol. Let the age of Monali be x years and the age of Sonali be y yrs

According first condition,

$x + y = 29$ ……(i)

Younger means smaller

According second condition,

$x = y - 3$

$x - y = -3$ ……(ii)

(iv) **Father is four times as old as his son. The age of the father at the time of the birth of his son was 30.**

Sol. Let father's present age be x years and his son's present age be y years

According first condition,

$x = 4y$

$x - 4y = 0$ ……(i)

According second condition,

$x - y = 30$ …..(ii)

Thank You

No. 13

Q. The taxi fare in a city is as follows : For the first kilometre, the fare is Rs. 8 and for the subsequent distance it is Rs. 5 per km. Taking the distance covered as *x* km and total fare as Rs. *y*, write a linear equation for this information, and draw its graph.

Sol :

Taxi fare

The information

$y = 8 + 5(x - 1)$

$\therefore \quad y = 8 + 5x - 5$

$\therefore \quad y = 5x + 3$

Now plot C(-2,-7)

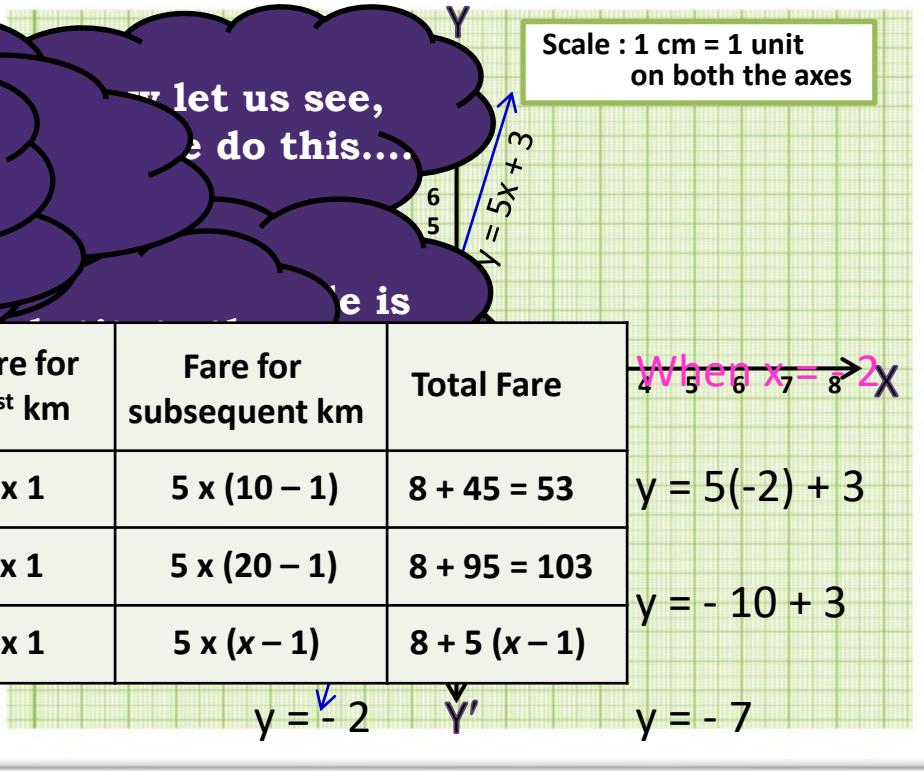
let us see,

do this....

e is

Total distance	Fare for 1st km	Fare for subsequent km	Total Fare
10 km	8 x 1	5 x (10 – 1)	8 + 45 = 53
20 km	8 x 1	5 x (20 – 1)	8 + 95 = 103
x km	8 x 1	5 x (*x* – 1)	8 + 5 (*x* – 1)

x	0	-1	-2
y	3	-2	-7
(x, y)	(0, 3)	(-1,-2)	(-2, -7)



No. 14

Q. Yamini and Fatima, two students of Class IX of a school, together contributed Rs. 100 towards the Prime Minister's Relief Fund to help the earthquake victims. Write a linear equation which this data satisfies. (You may take their contributions as Rs. *x* and)
Draw the graph of the

Sol : Let Yam
Rs.
Relie

∴ The linear e
data is

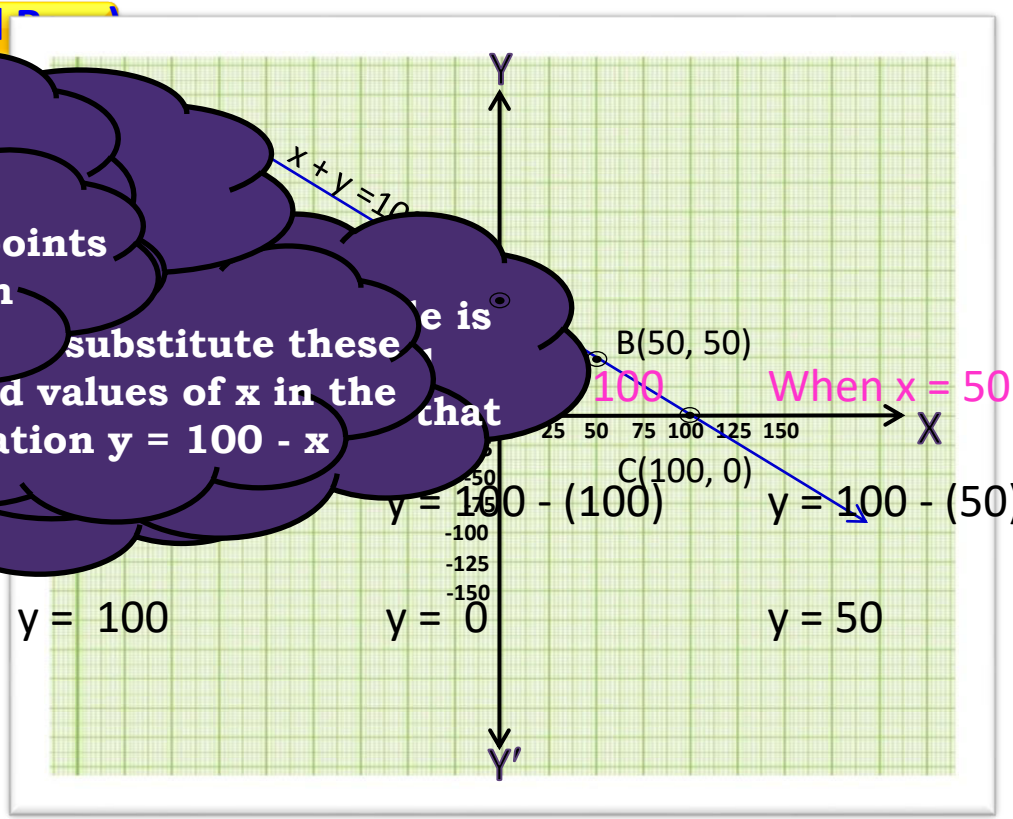
$x + y = 100$

∴ $y = 100 - x$

Now let us plot the points In these table on a graph paper

substitute these umed values of x in the Equation y = 100 - x

x	0	100	50
y	100	0	50
(x, y)	(0, 0)	(100,0)	(50, 50)



No. 15

Q From the choices given below, choose the equation whose graphs are given in Fig (a) and Fig (b).

For Figure (a)

(i) $y = x$

(ii) $x + y = 0$

(iii) $y = 2x$

(iv) $2 + 3y = 7x$

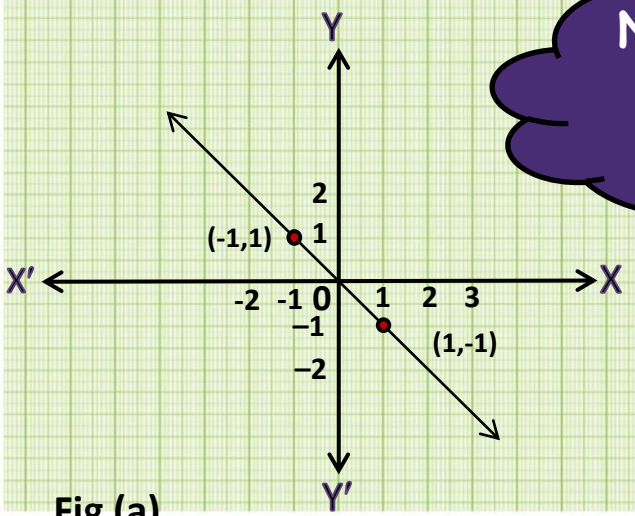


Fig (a)

Soln. For Fig. (a),

For point (-1, 1), $x = -1,\ y = 1$

For point (1, -1), $x = 1,\ y = -1$

The correct equation from the choices given is

$x + y = 0$

Now check these values satisfy which equation

$-1+1=0$

$1+(-1)=0$

$x + y = 0$

Q From the choices given below, choose the equation whose graphs are given in Fig (a) and Fig (b).

For Figure (b)

(i) $y = x + 2$
(ii) $y = x - 2$
(iii) $y = -x + 2$
(iv) $y + 2y = 6$

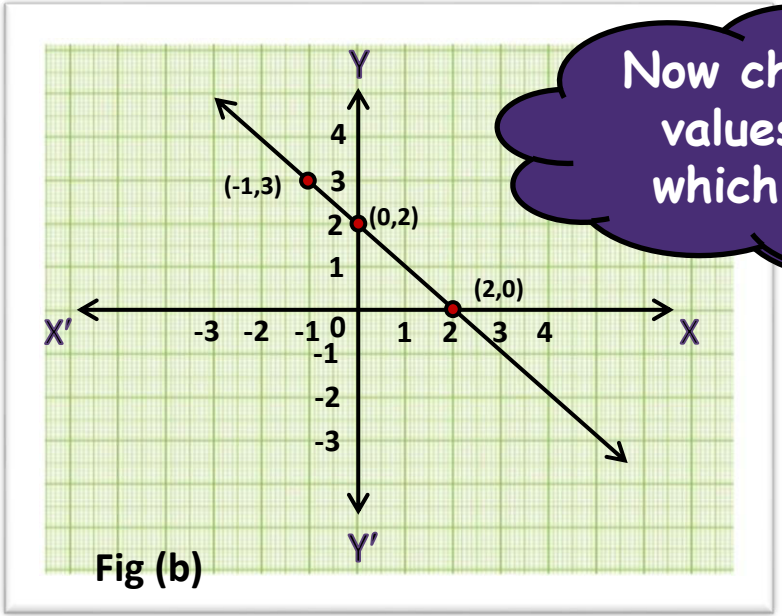


Fig (b)

Soln. For Fig. (b),

For point (-1, 3), $x = -1,\ y = 3$

For point (0, 2), $x = 0,\ y = 2$

For point (2, 0), $x = 2,\ y = 0$

The correct equation from the choices given is $y = -x + 2$

Now check these values satisfy which equation

$3 \neq -1 + 2$

$y \neq x + 2$

$3 \neq -3 - 2$

$y \neq x - 2$

$3 = -(-1) + 2$

$y = -x + 2$

No. 16

Q. In countries like the USA and Canada, temperature is measured in Fahrenheit, whereas in countries like India, it is measured in Celsius. Here is a linear equation that convert

i) Draw the g
using Celsi

Now let us plot the points In the table

Now draw a straight line passing through these points

titute these values of C in the Equation

Soln. (i) W

C	-40	10	40
F	-40	50	104

When C = -40 ,

$F = \frac{9}{5} \times (-40) + 32$

$= -72 + 32$

$= -40$

When C = 10 ,

$F = \frac{9}{5} \times 10 + 32$

$= 18 + 32$

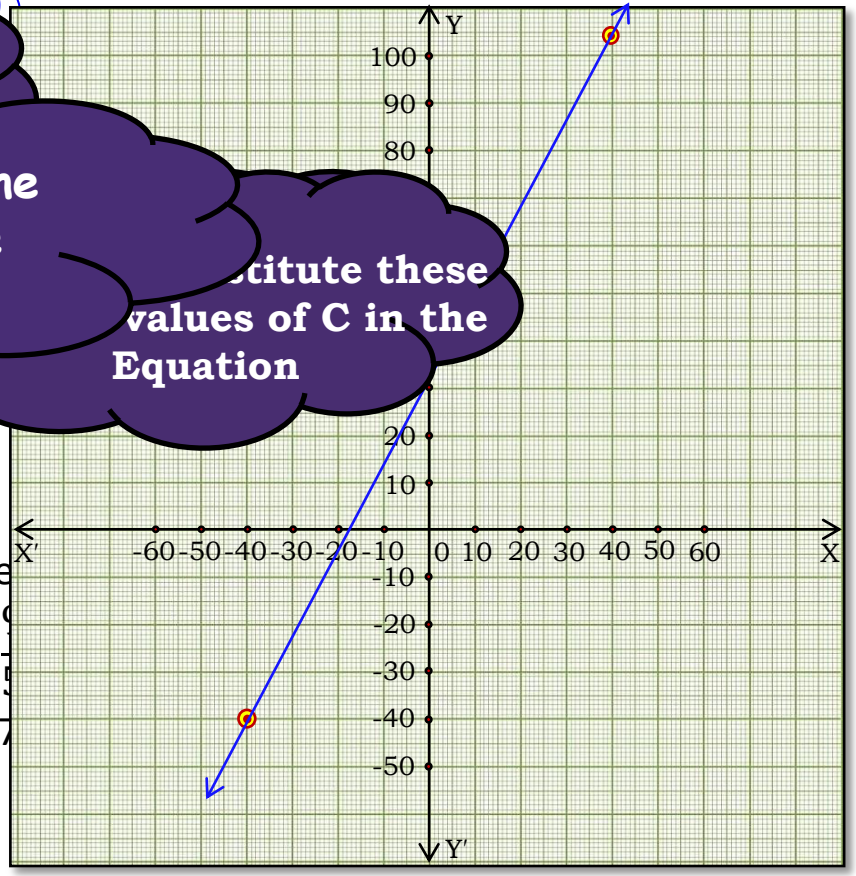
$= 50$

Whe

F =

=

=



Q. In countries like the USA and Canada, ... measured in Fahrenheit, whereas in countries like Indi... re is a linear equation that converts Fahrenheit to ...

(ii) If the temperature is 30^0C, what is the temperature in Fah...

Soln. Hence, $30^0C = 86^0F$.

(iii) If the temperature is 95^0F, what is the temperature in Celsius?

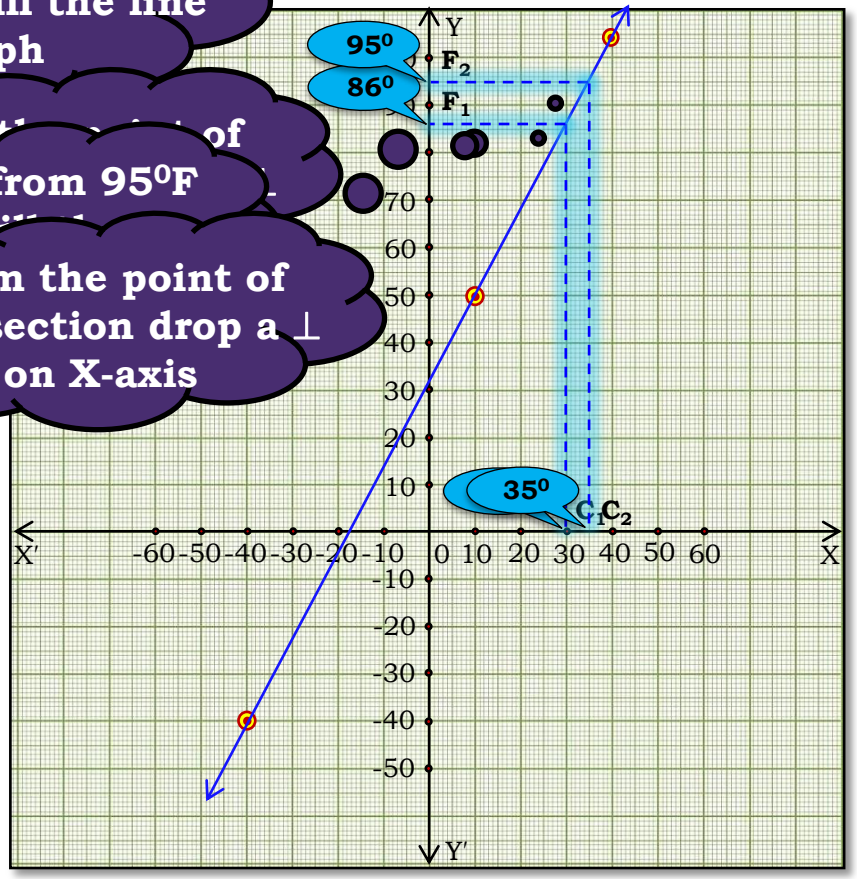
Soln. Hence, $95^0F = 35^0C$.

Draw a ⊥ from 30^0C on X-axis till the line graph

From ... of

Draw a ⊥ from 95^0F on Y-axis ...

From the point of intersection drop a ⊥ on X-axis



Q. In countries like the USA and Canada, t… easured in Fahrenheit, whereas in countries like Indi… re is a linear equation that converts Fahrenheit to…

(iv) If the temperature is 0^0C, what is the temperature in Fah… and if the temperature is 0^0F, what is the temperature in Celsius?

Soln. Hence, $0^0C = 32^0F$

and $0^0F = -17.5^0C$ (app…

(v) Is there a temperature which … the same in both Fahrenheit and … If yes, find it.

Soln. Yes, -40^0

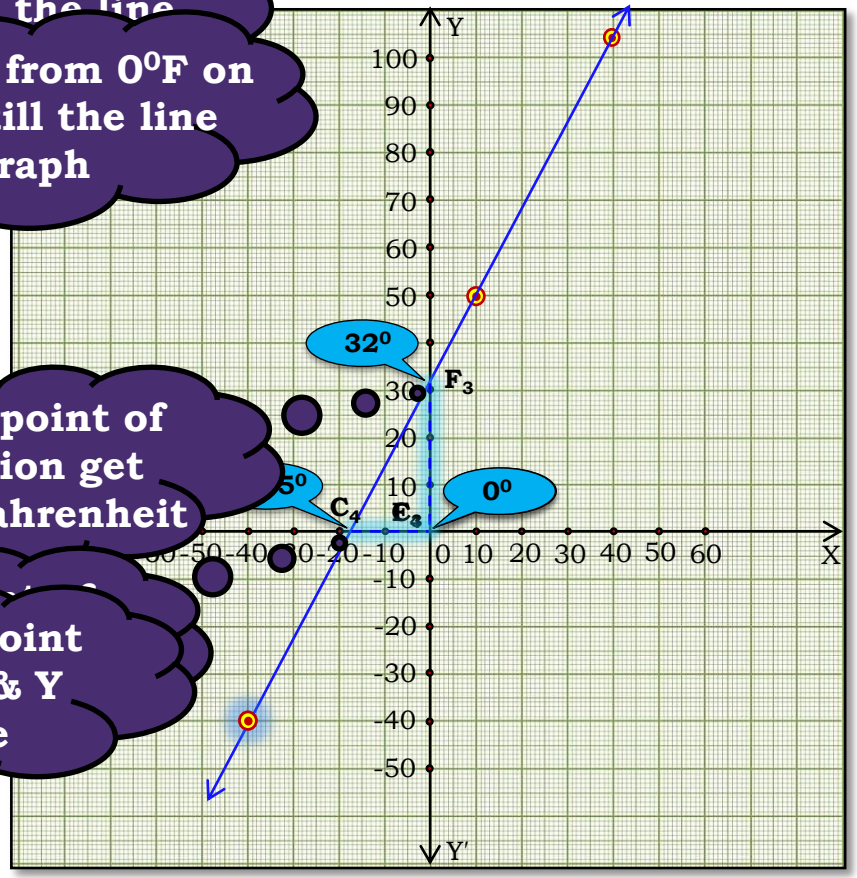
i.e., $-40^0C = -40^0F$.

Draw a ⊥ from 0^0C on X-axis till the line…

Draw a ⊥ from 0^0F on Y-axis till the line graph

From the point of intersection get temp. in Fahrenheit

Let us find a point with same X & Y co-ordinate



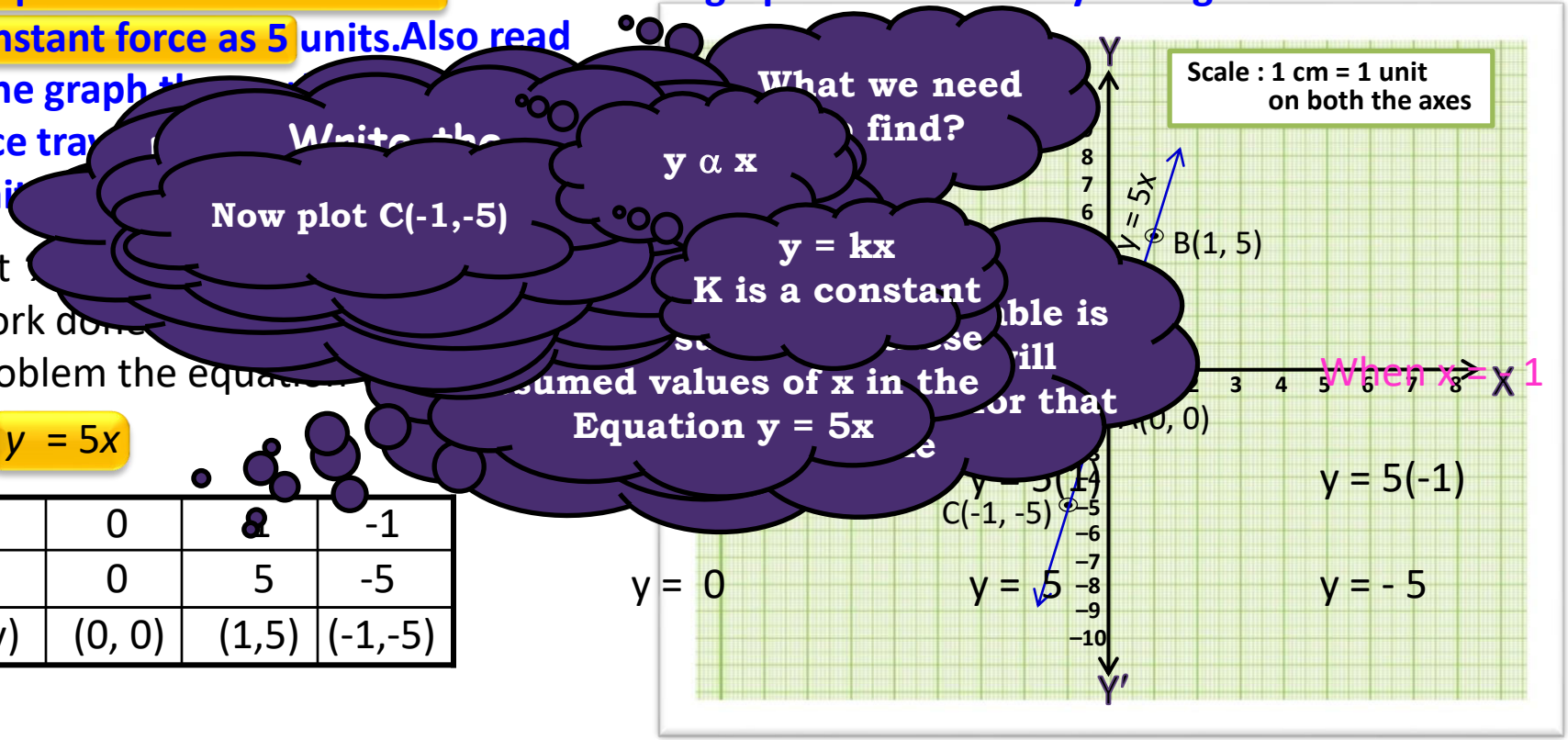
No. 17

Q. If the work done by a body on application of a constant force is directly proportional to the distance travelled by the body.Express this in the form of an equation in two variables and draw the graph of the same by taking the constant force as 5 units.Also read from the graph the distance travelled by the body when the work done is (i) 2 units (ii) 1 unit

Sol : Let x units be the distance travelled by the body and y units be the work done. According to the problem the equation is

$\therefore$ $y = 5x$

x	0	1	-1
y	0	5	-5
(x, y)	(0, 0)	(1,5)	(-1,-5)



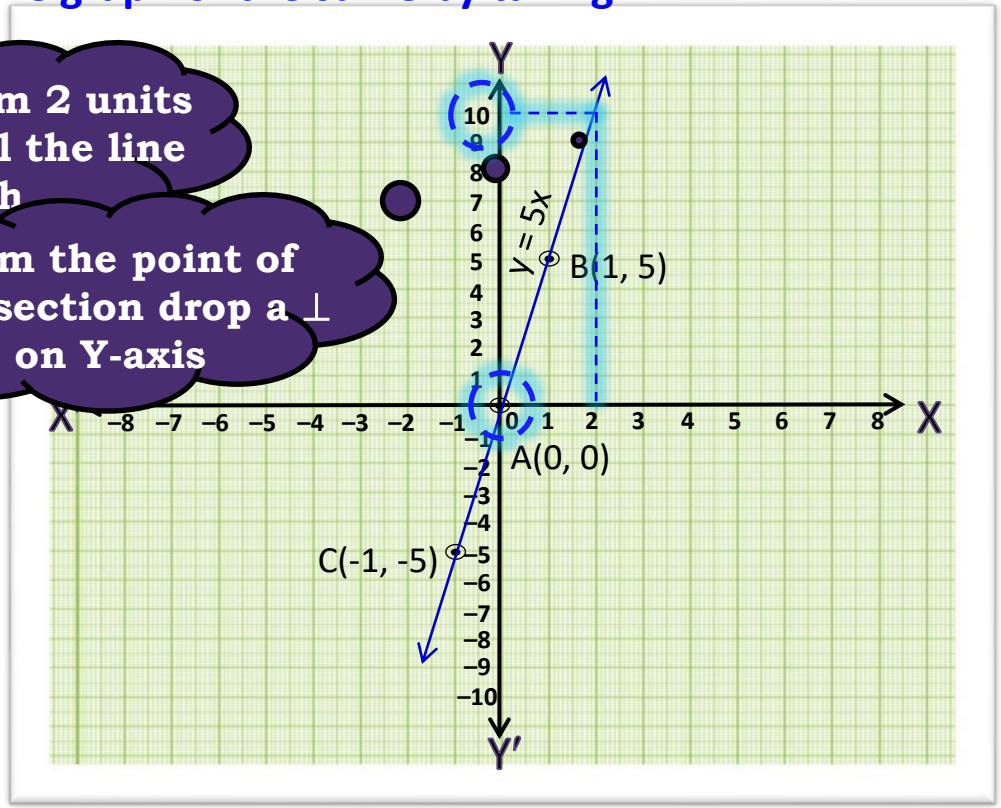
Q. If the work done by a body on application of a constant force is directly proportional to the distance travelled by the body.Express this in the form of an equation in two variables and draw the graph of the same by taking the constant force as 5 units.Also read from the graph the work don distance travelled by the b (i) 2 units, (ii) 0 unit.

Sol : (i) For distance travelled 2 u

Work done is 10 units

(ii) For distance travelled 0 units

Work done is 0 units



Thank You

No. 18

Q.) A two digit number is 3 more than six times the sum of its digits. If its unit's and ten's digit are x and y respectively, write the linear equation representing the above information.

Two digit no. consist of digit in tens place and a digit in units place

Sol. Let the digit in tens place be 'x' and the digit in the unit place be 'y'

Tens	Units
$10 \times x$	$1 \times y$

Two digit number is = $10x + y$

As per the first condition,

$10x + y = 6(x + y) + 3$

$10x + y = 6x + 6y + 3$

$10x - 6x + y - 6y = 3$

$4x - 5y = 3$

Q. Aarushi was driving a car with uniform speed of 60 km/h. draw distance-time graph. From the graph, find the distance travelled by Aarushi in

(i) $2\frac{1}{2}$ Hours (ii) $\frac{1}{2}$ Hour

Soln. We know that,

Distance = Speed × Time

Time	1	2	3
Distance	60	120	180

(i) $2\frac{1}{2}$ Hours

From graph, distance covered is 150 kms

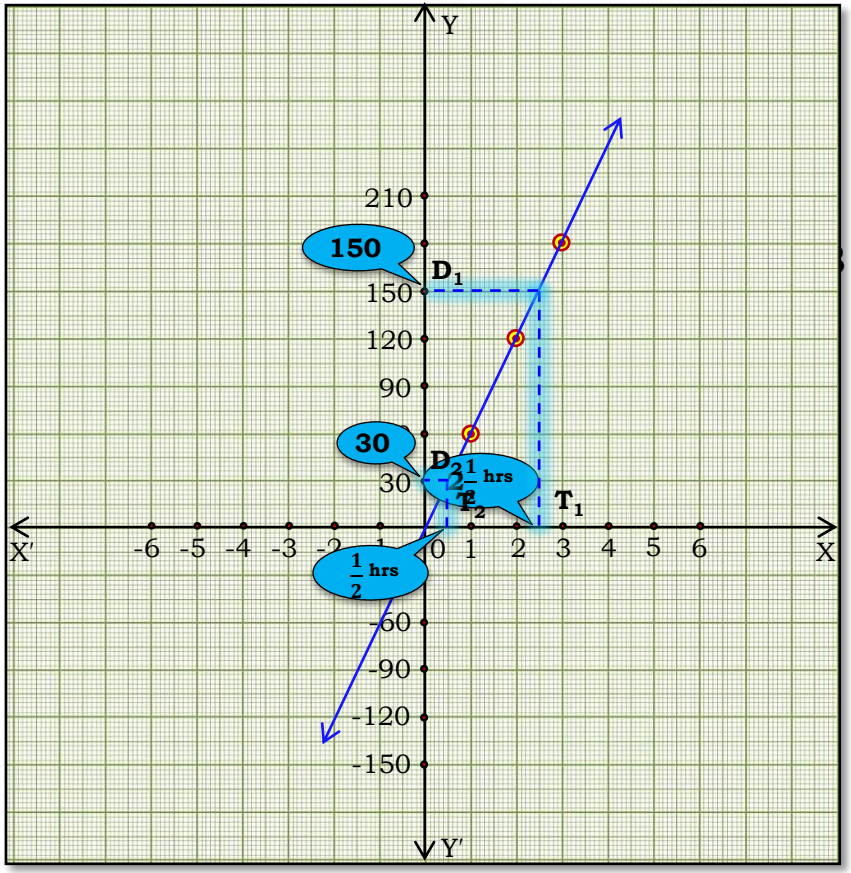
(ii) $\frac{1}{2}$ Hours

From graph, distance covered is 30 kms

When

D =

D =

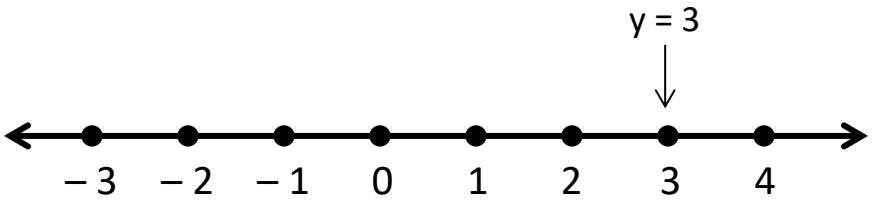


No. 19

Q. Give the geometric representations of y = 3 as an equation :
(i) in one variable (ii) in two variables

Sol. (i) When y = 3 is treated as an equation in one variable,

The geometric representation will be on the number line.



Let us draw a number line

3 on number line represent y=3

Q. Give the geometric representati
(ii) in two variables

Sol : We know that,

$y = 3$

$\therefore$ $0x + y = 3$

$\therefore$ $y = 3 - 0x$

x	0	2	−2
y	3	3	3
(x, y)	(0, 3)		

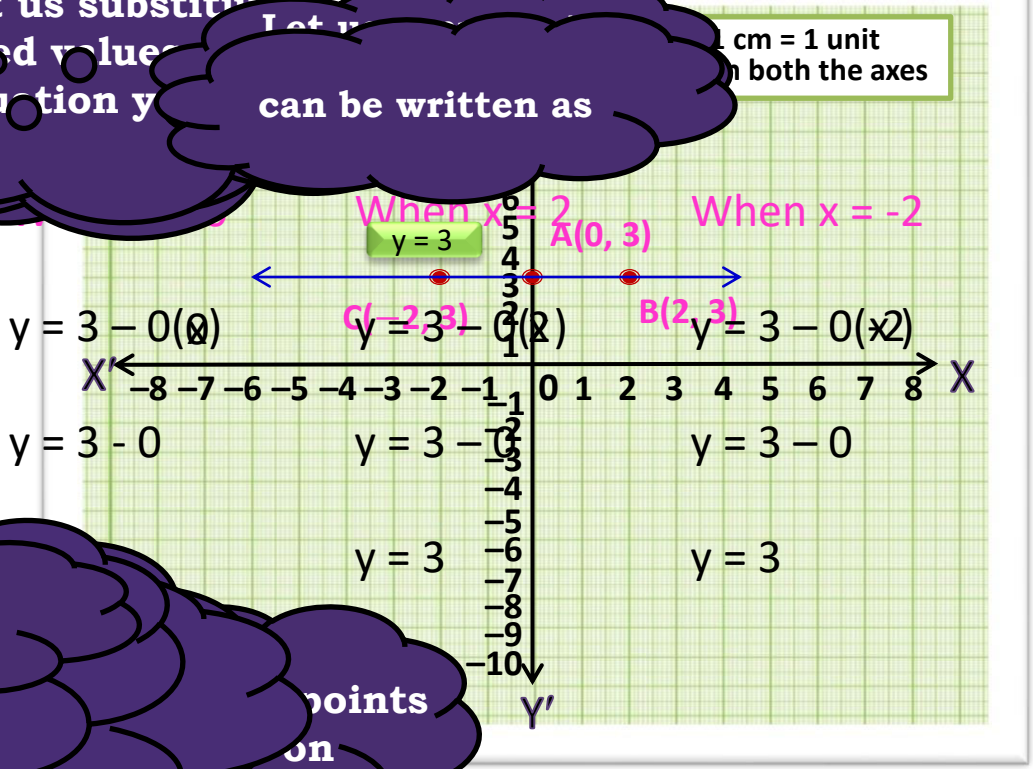
Now let us substitut
Assumed value
Equation y

can be written as

Now plot C(−2, 2)

line

points
on
paper



Q. Give the geometric representations of $2x + 9 = 0$ as an equation :
(i) in one variable (ii) in two variables

Sol. (i) $2x + 9 = 0$

$\therefore \quad 2x = -9$

$\therefore \quad x = \frac{-9}{2}$

$\therefore \quad x = -4.5$

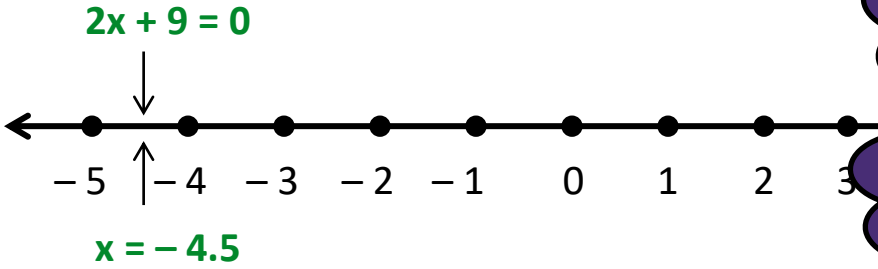
$\therefore$ When $x = -4.5$ is treated as an equation in one variable

The geometric representation will be on the number l

Let us solve this equation

Let us draw a number line

-4.5 on number line represent 2x + 9 = 0



Q. Give the geometric representati
(ii) in two variables

Sol : We know that,

$2x + 9 = 0$

$\therefore \quad 2x + 0y + 9 = 0$

$\therefore \quad 2x = -9 - 0y$

$\therefore \quad x = \dfrac{-9 - 0y}{2}$

x	$\frac{-9}{2}$	$\frac{-9}{2}$	$\frac{-9}{2}$
y	0	2	-2
(x, y)	$(\frac{-9}{2}$		

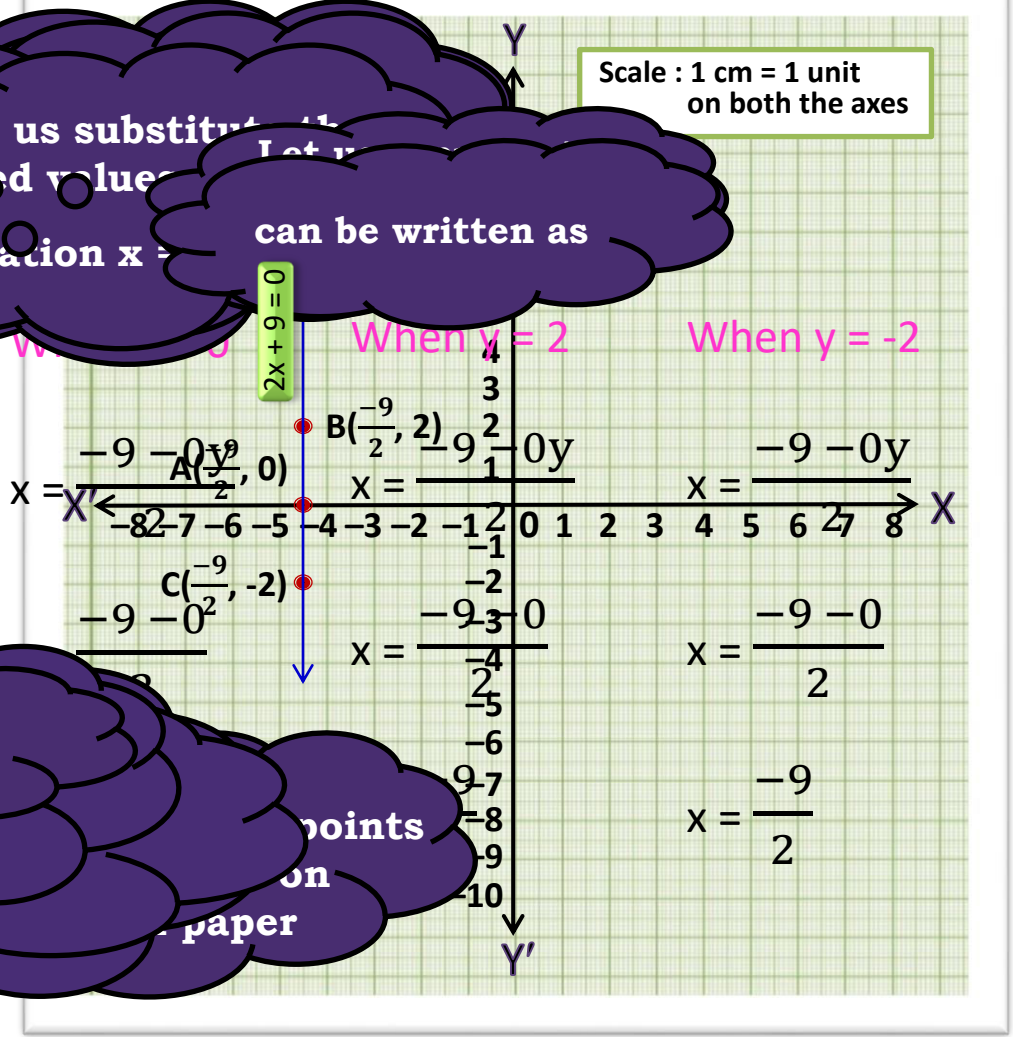
Now let us substitut
Assumed value
Equation x =

can be written as

Now plot $C(\frac{-9}{2}, 2)$

line

points
on
paper



No. 20

Q.] Express the following linear equations in the form $ax + by + c = 0$ and indicate the values of a, b and c in each case :

(vii) $y - 2 = 0$

Sol. $y - 2 = 0$

$\therefore \quad 0x + 1y - 2 = 0$

On comparing wi

$a = 0, \quad b =$

Comparing eqⁿ with
$ax + by + c = 0$

Q.] Check which of the following are solutions of the equation $x - 2y = 4$ and which are not :

(ii) (2, 0)

Sol. $x - 2y = 4$

Putting $x = 2, y = 0$ in L.H.S. of $x - 2y = 4$,

We have

$$\text{L.H.S.} = x - 2y$$
$$\text{L.H.S.} = 2 - 2(0)$$
$$= 2 - 0$$
$$= 2$$
$$\neq \text{R.H.S.}$$

$\therefore$ $x = 2, y = 0$ is not its solution.

Q.] Draw the graph of each of the … **variables :**

(i) $y = 3x$

We have to prepare a table of coordinates fo…

Sol. We have, $y = 3x$

x	0	1	–1
y	0	3	–3
(x, y)	(0, 0)	(1, 3)	(–1, –3)

When x = 0

$y = 3(0)$

$= 0$

When x = 1

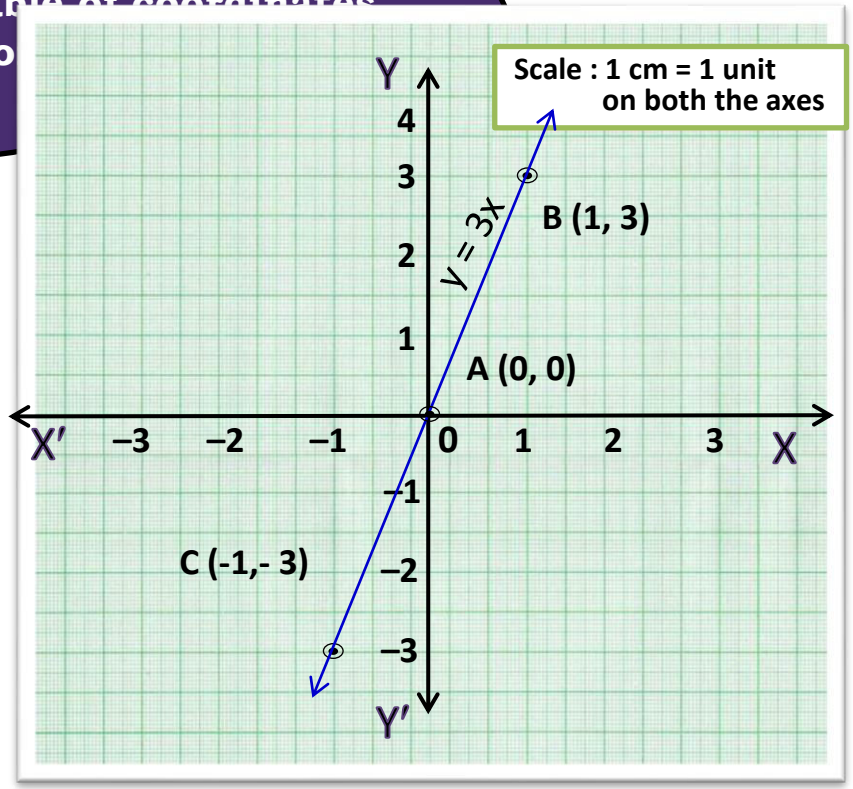
$y = 3(1)$

$= 3$

When x = – 1

$y = 3(–1) = – 3$

$= – 3$



No. 21

Q. Find a and b if the points P (3, 0) and Q $\left(2, \frac{4}{3}\right)$ lie on the graph ax + by = 12.

Sol. Since point P (3, 0) lie on graph ax + by = 12 it satisfies the equation.

Substituting x = 3, y = 0 in the equation ax + by = 12

$a \times (3) + b \times (0) = 12$

$\therefore \quad 3a + 0 = 12$

$\therefore \quad a = \frac{12}{3}$

$\therefore \quad \mathbf{a = 4}$

Similarly Q $\left(2, \frac{4}{3}\right)$ lie on the graph ax + by = 12

Hence it will also satisfy the equation.

Substituting x = 2, y = $\frac{4}{3}$, a = 4 in the equation ax + by = 12

$4 \times (2) + b \times \left(\frac{4}{3}\right) = 12$

$\therefore \quad 8 + \frac{4b}{3} = 12$

$\therefore \quad \frac{4b}{3} = 12 - 8$

$\therefore \quad \frac{4b}{3} = 4$

$\therefore \quad b = 4 \times \frac{3}{4}$

$\therefore \quad \mathbf{b = 3}$

Thank You