NEET

2027

Introduction to Linear Polynomials

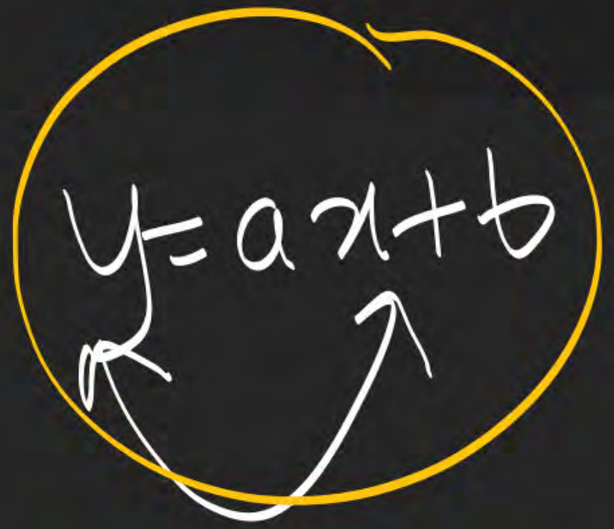
Lecture-8

CLASS-9TH | MATHS

Ritik Sir

Topics To Be Covered

1. y - intercept / x- intercept.
2. Badhiya Questions

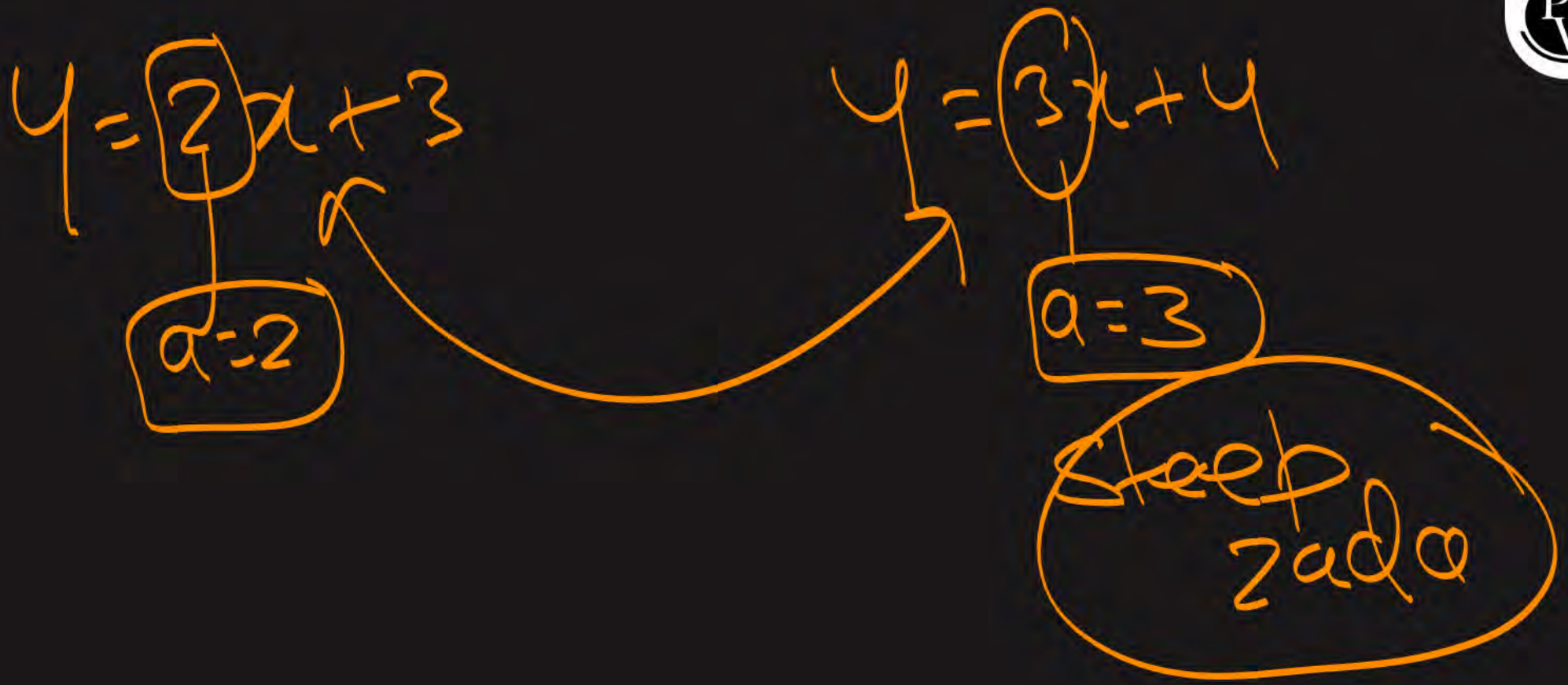


→ Straight line.

→ Slope.

Introduction to Linear Polynomials

Lecture – 8


y = 2x + 3
a = 2
y = 3x + 4
a = 3
Keep
zada

QUESTIONS

$y = 2x + 1$

$y = 2x + 5$

What stayed the same?

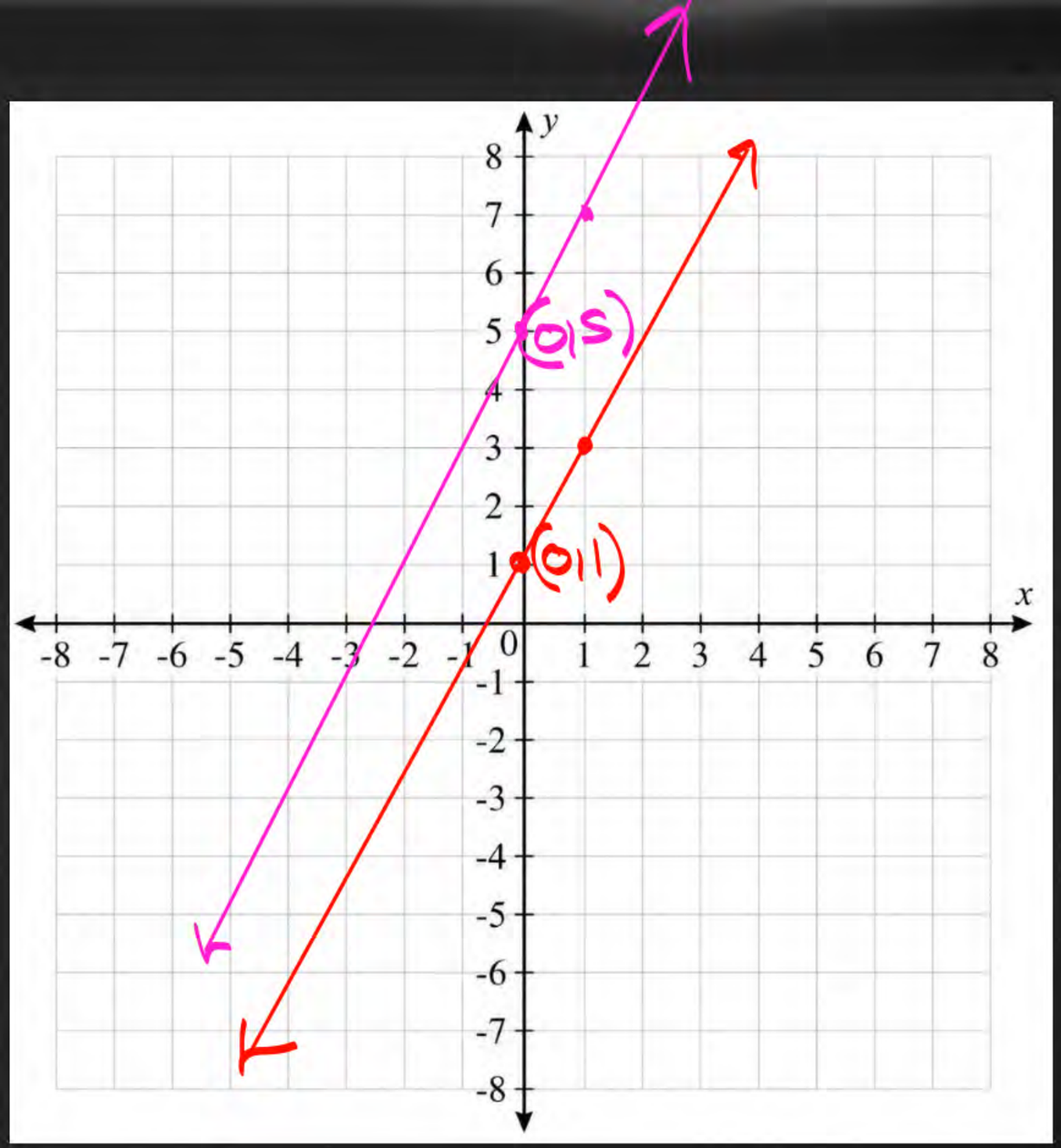
What changed?

$y = 2x + 1$

x	0	1
y	1	3

$y = 2x + 5$

x	0	1
y	5	7



y - intercept

The point where a graph cuts the y-axis is called the y-intercept.

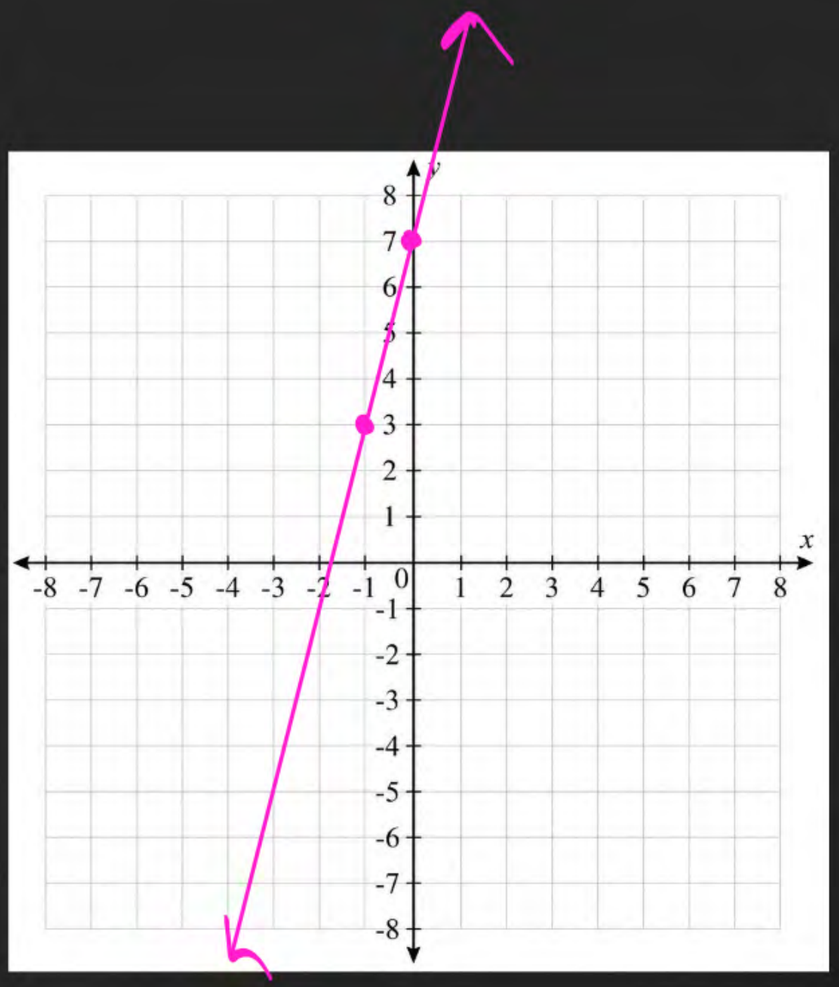
X - intercept

The point where a graph cuts the x-axis is called the x-intercept.

QUESTIONS

Find the y-intercept.

$y = 4x + 7$



QUESTIONS

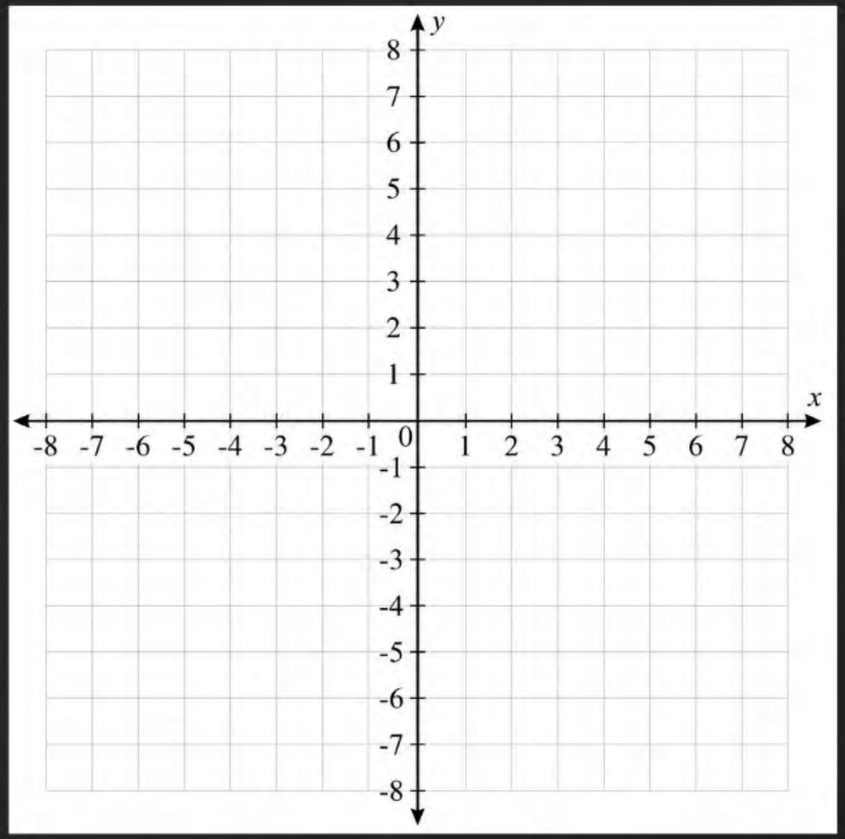
Find the y-intercept.

$y = -2x + 3$

Slope = -2

y-intercept = 3

→ Ye line y-axis ko (0,3) par cut karegi.



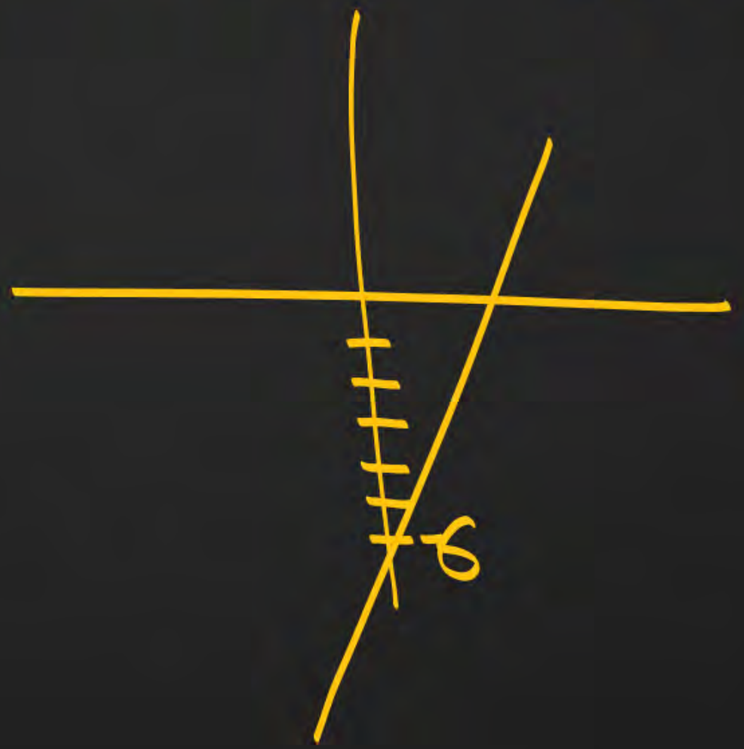
QUESTIONS

Find the y-intercept.

$y = 5x - 6$ → ye line y-axis ko kahan par cut karegi = (0, -6)

b = -6

y intercept



QUESTIONS

Find the y-intercept.

$$y = \frac{1}{2}x + 9$$

QUESTION

SAME a, DIFFERENT b

Draw and compare:

$y = 2x - 1$ — $b = -1$

$y = 2x + 1$ — $b = 1$

$y = 2x + 5$ — $b = 5$

Parallel

Slope same (a)

Final Summary

$y = ax + b$

For $y = ax + b$

a controls

- slope
- steepness
- rise or fall

b controls

- y-intercept
- position of the graph

QUESTIONS

i) In the equation y=ax+b, a represents the slope of the line and b represents the y-intercept.

(ii) If we change the values of a, keeping b fixed, the slope of the line changes while the y-intercept remains fixed.

(iii) If we change the values of b keeping the value of a fixed, the lines shift but remain parallel to the original line. Thus, lines with equal slopes but different y-intercepts are parallel to each other.

$y = 2x + 3$
$y = 2x - 5$
] Parallel.

QUESTIONS

Draw the graphs of the following sets of lines. In each case, reflect on the role of 'a' and 'b'.

$y = 4x, y = 2x, y = x$

b=0 → line passes through the origin

Equation	Slope.	y-intercept	
$y=4x$	4 (Steepest)	0	(0,0)
$y=2x$	2	0	(0,0)
$y=x$	1	0	(0,0)

In these graphs, the value of b is 0, so all the lines pass through the origin. As the value of a increases, the line becomes steeper.

Therefore $y = 4x$ is steeper than $y = 2x$, which is steeper than $y = x$.

QUESTIONS

Draw the graphs of the following sets of lines. In each case, reflect on the role of 'a' and 'b'.

$y = -6x$, $y = -3x$, $y = -x$

-ve slope = Fall.

Steepest = $y = -6x$

lines passes through = origin.

QUESTIONS

Draw the graphs of the following sets of lines. In each case, reflect on the role of 'a' and 'b'.

$y = 5x, y = -5x$

passes through origin (b=0)

same steepness.

Rise.

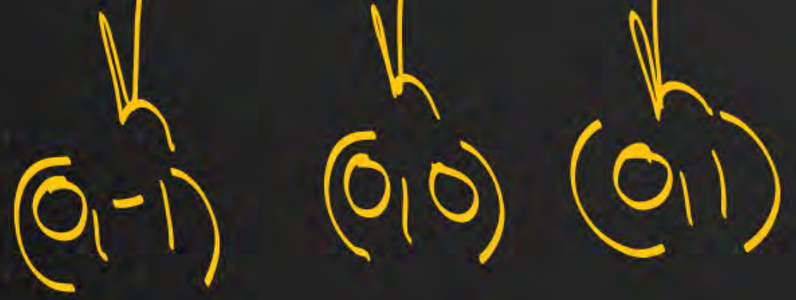
Fall.

QUESTIONS

Draw the graphs of the following sets of lines. In each case, reflect on the role of 'a' and 'b'.

$y = 3x - 1, y = 3x, y = 3x + 1$

→ Same steepness → parallel.



→ $y = -4x + 2$

y-intercept ($x = 0$)

$y = -4(0) + 2$

$y = 2$

$(0, 2)$

x-intercept ($y = 0$)

$0 = -4x + 2$

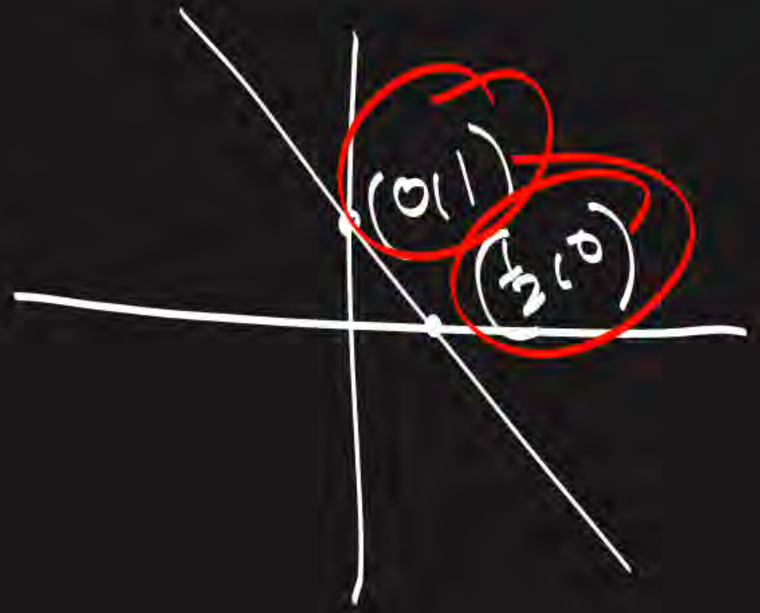
$-2 = -4x$

$\frac{-2}{-4} = x$

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

$(\frac{1}{2}, 0)$

Q. $y = -2x + 1$



y-intercept $(x = 0)$

$y = -2(0) + 1$

$y = 1$

$(0, 1)$

x-intercept $(y = 0)$

$0 = -2x + 1$

$-1 = -2x$

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

$\left(\frac{1}{2}, 0\right)$

Q. $2y = 2x - 3$

y-intercept → ($x = 0$)

$2y = 2(0) - 3$

$2y = -3$

$y = -\frac{3}{2}$

$\left(0, -\frac{3}{2}\right)$

x-intercept → ($y = 0$)

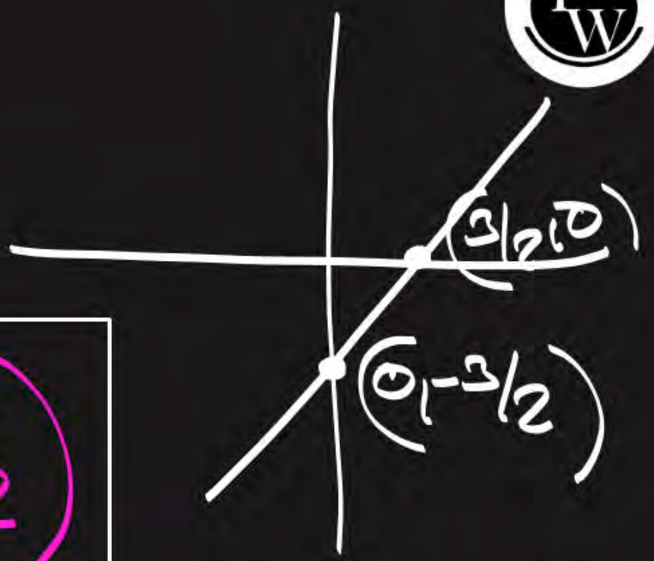
$2(0) = 2x - 3$

$0 = 2x - 3$

$3 = 2x$

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

$\left(\frac{3}{2}, 0\right)$



QUESTIONS

Draw the graph of the following equations, and identify their slopes and y-intercepts. Also, find the coordinates of the points where these lines cut the y-axis.

i) $y = -3x + 4$ → S=-3, y-intercept = 4, (0,4)

ii) $2y = 4x + 7$ → $y = \frac{4x}{2} + \frac{7}{2}$ → $y = 2x + \frac{7}{2}$

iii) **$5y = 6x - 10$**

iv) **$3y = 6x - 11$** #Graph

Are any of the lines parallel?

Slope = 2

y-intercept = 7/2

Cuts the y-axis at = $(0, \frac{7}{2})$

(iii) $5y = 6x - 10$

slope $= 6/5$

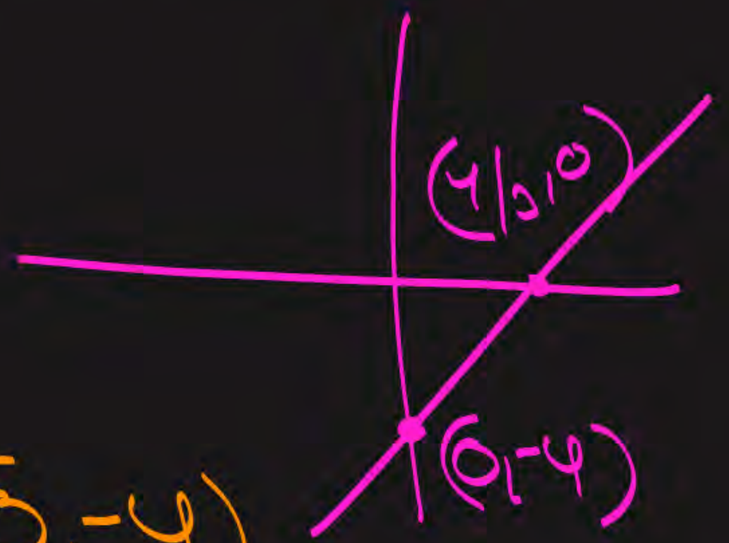
y-intercept $= -2$

cut the y-axis $= (0, -2)$

Q. $3y = 9x - 12 \rightarrow y = \frac{9x}{3} - \frac{12}{3} \rightarrow \boxed{y = 3x - 4}$

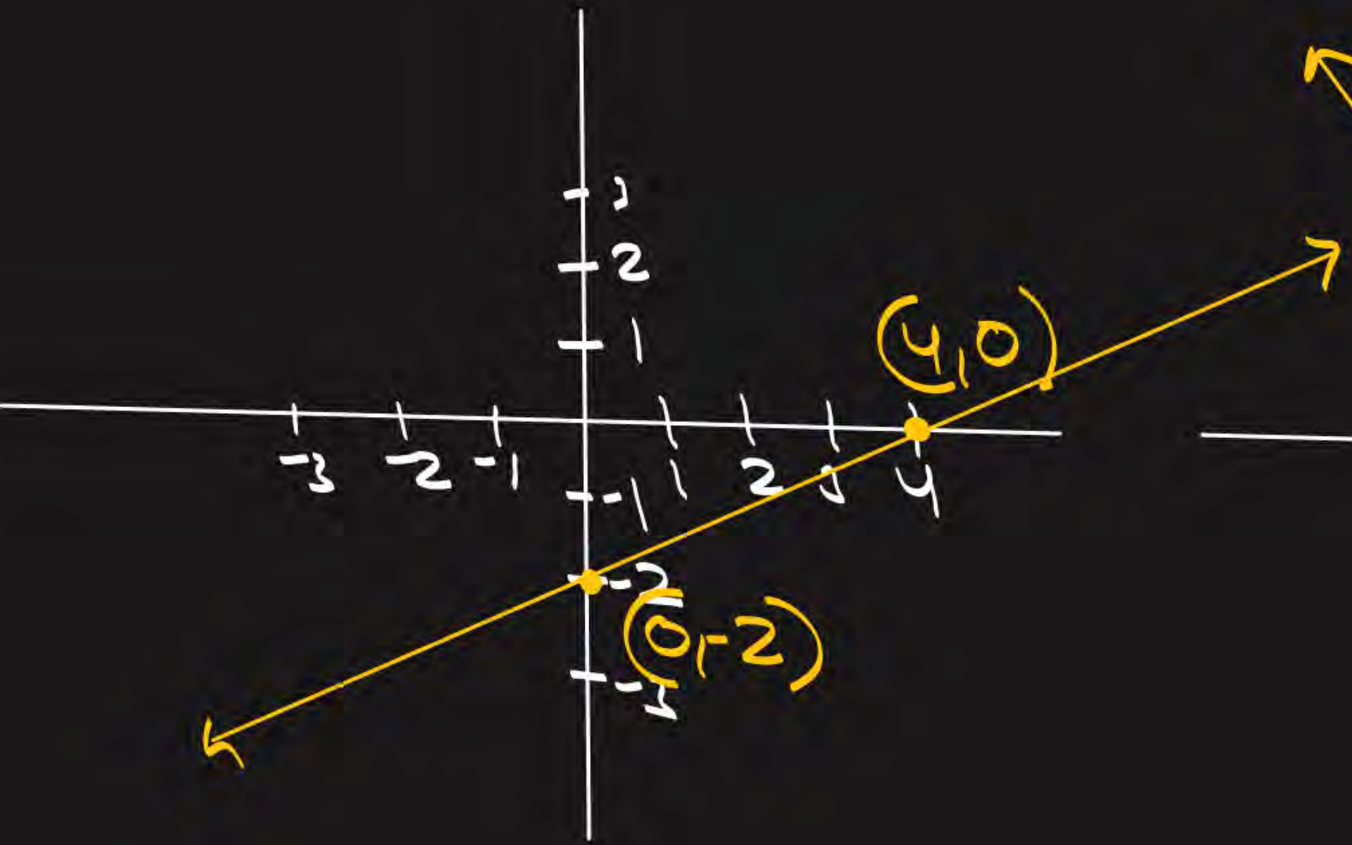
slope ? (3)

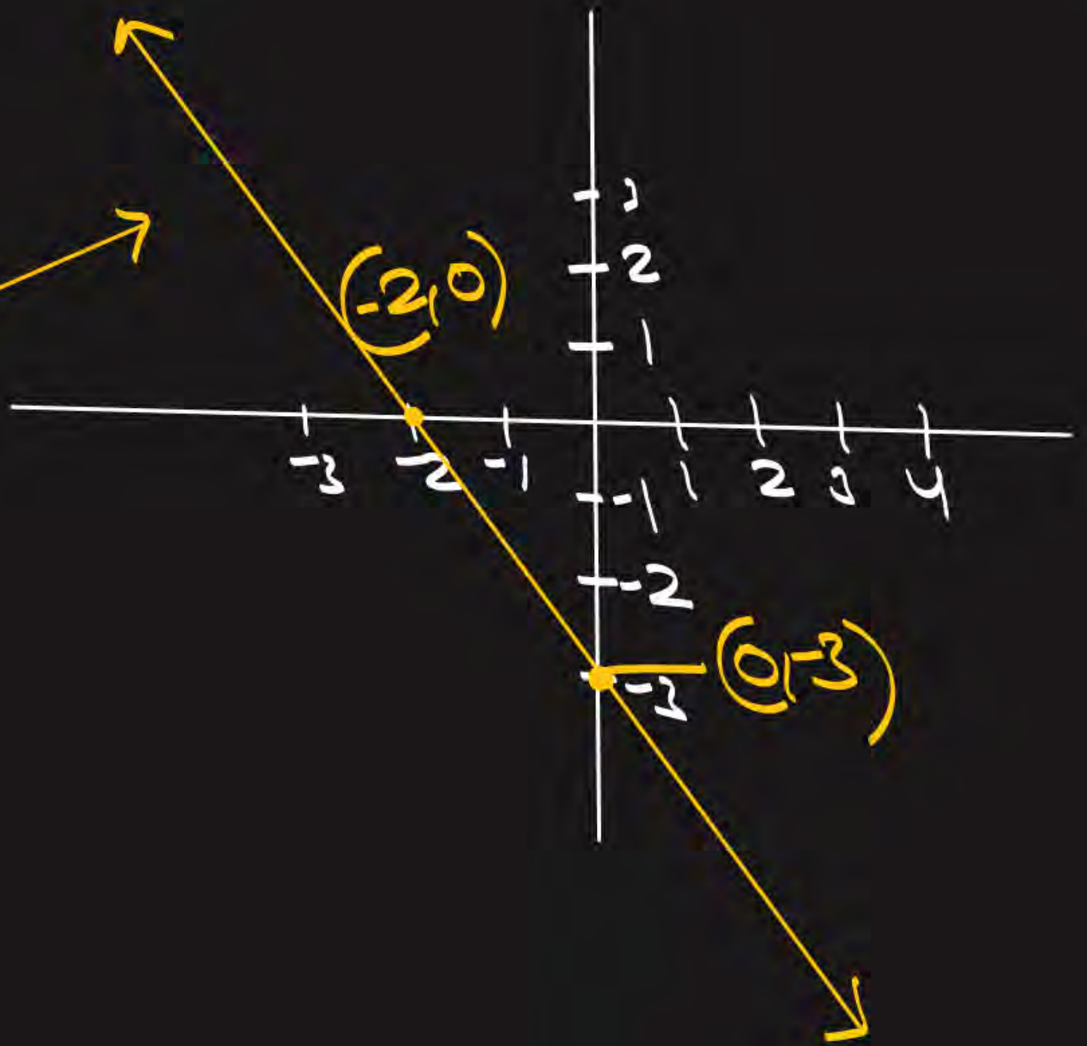
y-intercept ? (-4)



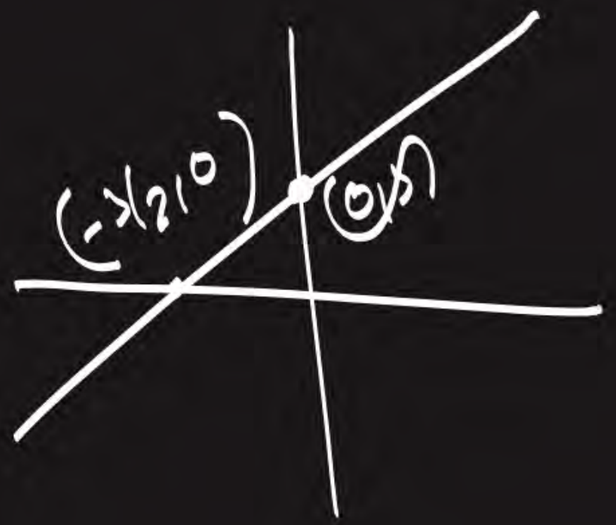
cut the y axis at what point ? (0, -4)

cut the x-axis at which point ? (4/3, 0)


(4,0)
(0,-2)


(-2,0)
(0,-3)

Q. $y = 2x + 3$



X intercept ($y = 0$)

$0 = 2x + 3$

$-3 = 2x$

$-3/2 = x$

$\left(-\frac{3}{2}, 0\right)$

Y-intercept ($x = 0$)

$y = 2(0) + 3$

$y = 3$

$(0, 3)$

A line passes through:

$(1, 4)$

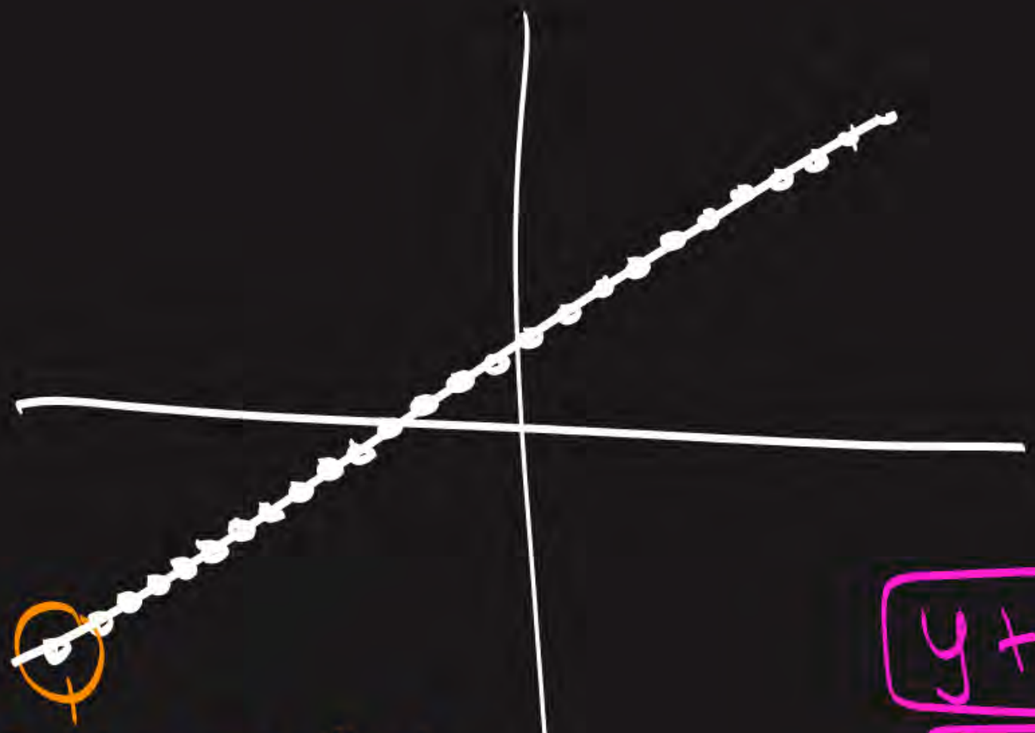
and

$(3, 8)$

Assume

$y = ax + b$

Find a and b.



Points = coordinates.

Solutions.

$y + x = 4$

(0, 4)
(4, 0)
(1, 3)
(6, -2)

(8, -4)
(10, -6)

A line passes through:

$(1, 4)$

and

$(3, 8)$

Assume

$$y = ax + b$$

Find a and b.

$y = ax + b$

$(1, 4)$

$4 = a(1) + b$

$4 = a + b$ — (1)

$y = ax + b$

$(3, 8)$

$8 = 3a + b$ — (2)

$a + b = 4$

$3a + b = 8$

$-2a = -4$

$a = 2$

$a + b = 4$

$2 + b = 4$

$b = 2$

$y = ax + b$

$y = 2x + 2$

A graph passes through:

$(0, 5)$

and

$(2, 9)$

Find the equation.

$y = ax + b$

$y = 2x + 5$

$y = ax + b$

$(0, 5)$ $(2, 9)$

$5 = a(0) + b$

$\boxed{5 = b}$

$9 = a(2) + b$

$9 = 2a + b$

$9 = 2a + 5$

$2a + 5 = 9$

$2a = 4$

$\boxed{a = 2}$

A graph passes through:

$(1, 3)$

and

$(3, 7)$

Find:

1. Equation
2. x-intercept
3. y-intercept

$y = ax + b$

$(1,3)$ $(1,3)$ $(3,7)$

$3 = a + b$

$7 = 3a + b$

$a + b = 3 \rightarrow 2 + b = 3$

$b = 1$

$3a + b = 7$

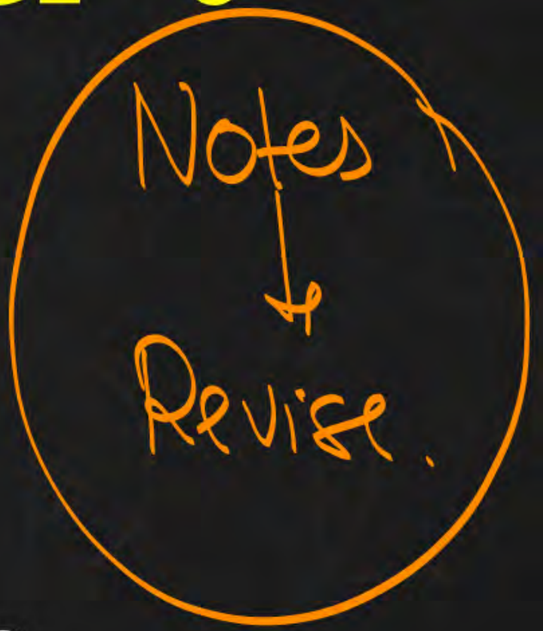
$-2a = -4$

$a = 2$

$y = 2x + 1$

-1/2

1

Thank You !

- *Work Hard.*
- *Dream big.*
- *Never give up.*