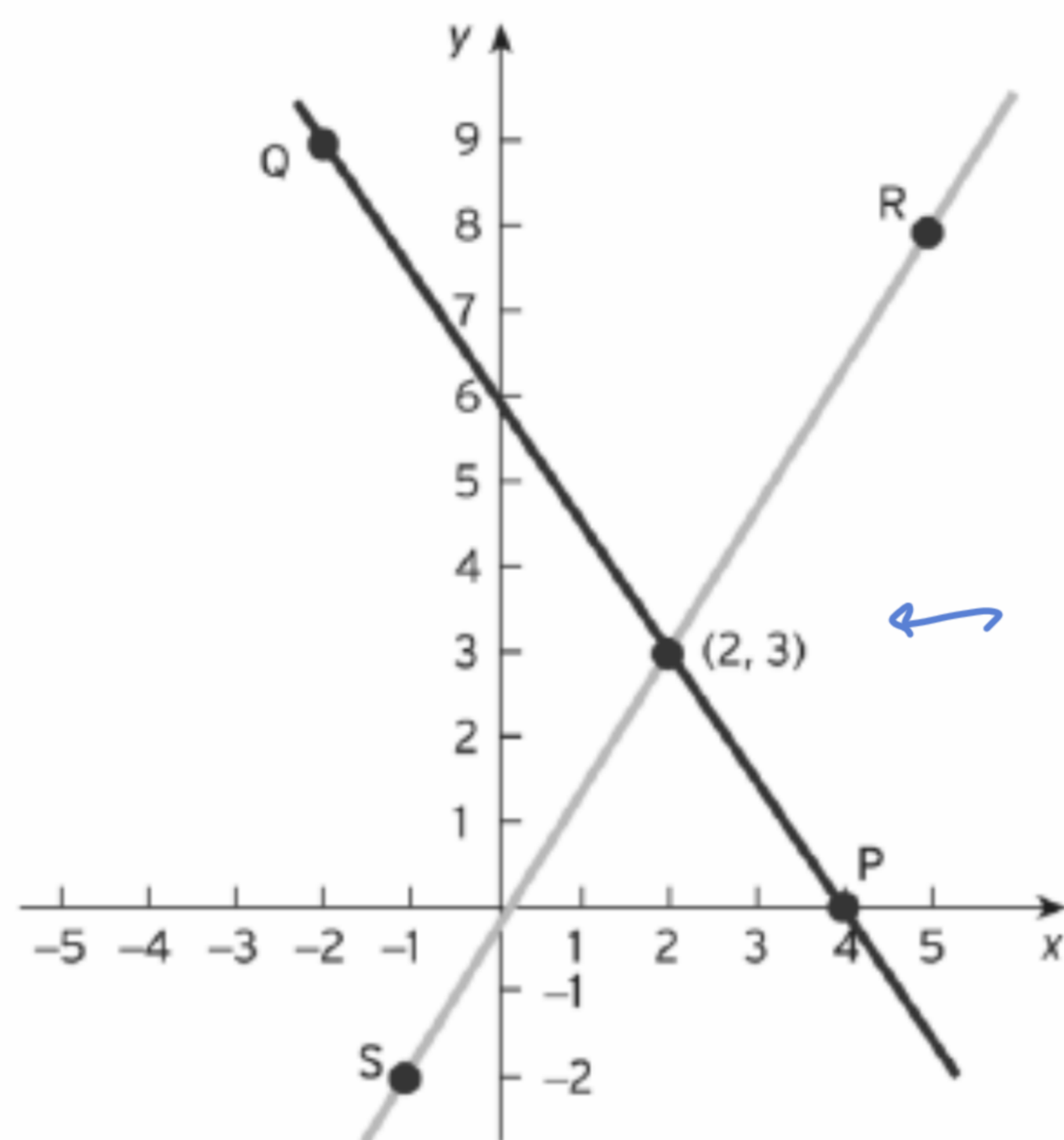


Exercise 1.3

1. On graph paper draw axes with values of x and y between -3 and 10 , and plot the following points:

$$P(4, 0), Q(-2, 9), R(5, 8), S(-1, -2)$$

Hence find the coordinates of the point of intersection of the line passing through P and Q , and the line passing through R and S .



Point of intersection
(2, 3)

4. For the line $3x - 5y = 8$,

(a) find the value of x when $y = 2$;

(b) find the value of y when $x = 1$.

Hence write down the coordinates of two points which lie on this line.

$$(a) \quad 3x - 5(2) = 8$$

$$3x - 10 = 8$$

$$3x = 8 + 10$$

$$3x = 18$$

$$x = \frac{18}{3}$$

$$x = 6$$

$$(6, 2)$$

$$(b) \quad 3(1) - 5y = 8$$

$$3 - 5y = 8$$

$$-5y = 8 - 3$$

$$-5y = 5$$

$$y = \frac{5}{-5}$$

$$y = -1$$

$$(1, -1)$$

5. If $4x + 3y = 24$, complete the following table and hence sketch this line.

x	y
0	8
6	0
3	4

x=0:

$$4(0) + 3y = 24$$

$$3y = 24$$

$$y = \frac{24}{3}$$

$$y = 8$$

y=0

$$\therefore 4x + 3(0) = 24$$

$$4x = 24$$

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

$$x = 6$$

x=3

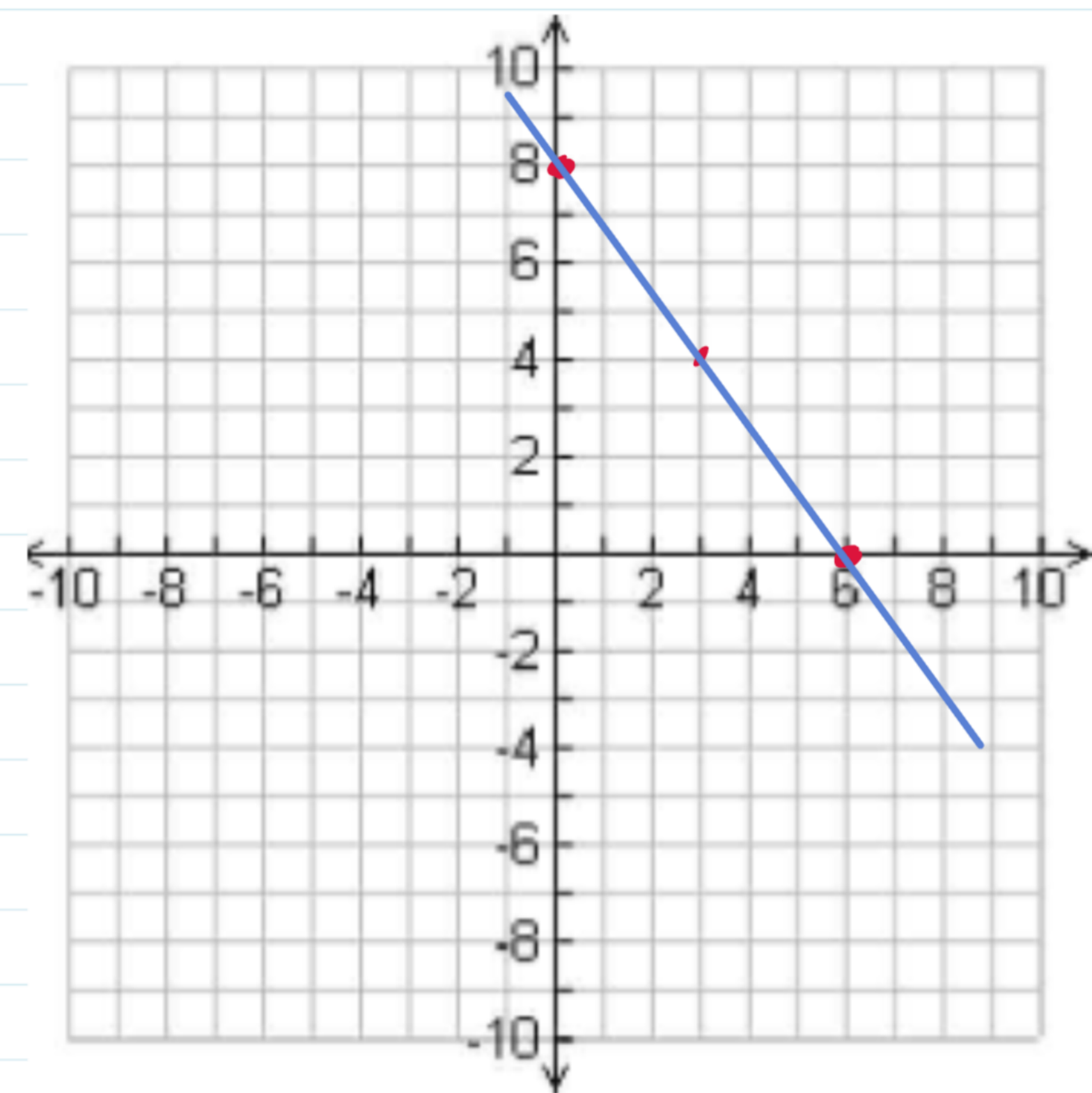
$$4(3) + 3y = 24$$

$$12 + 3y = 24$$

$$3y = 24 - 12$$

$$3y = 12$$

$$y = \frac{12}{3} = 4$$



6. Solve the following pairs of simultaneous linear equations graphically:

(a) $-2x + y = 2$
 $2x + y = -6$

x=0

$$-2(0) + y = 2$$

$$y = 2$$

$$(0, 2)$$

y=0

$$-2x + 0 = 2$$

$$-2x = 2$$

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

$$x = -1$$

$$(-1, 0)$$

x=0

$$2(0) + y = -6$$

$$y = -6$$

$$(0, -6)$$

y=0

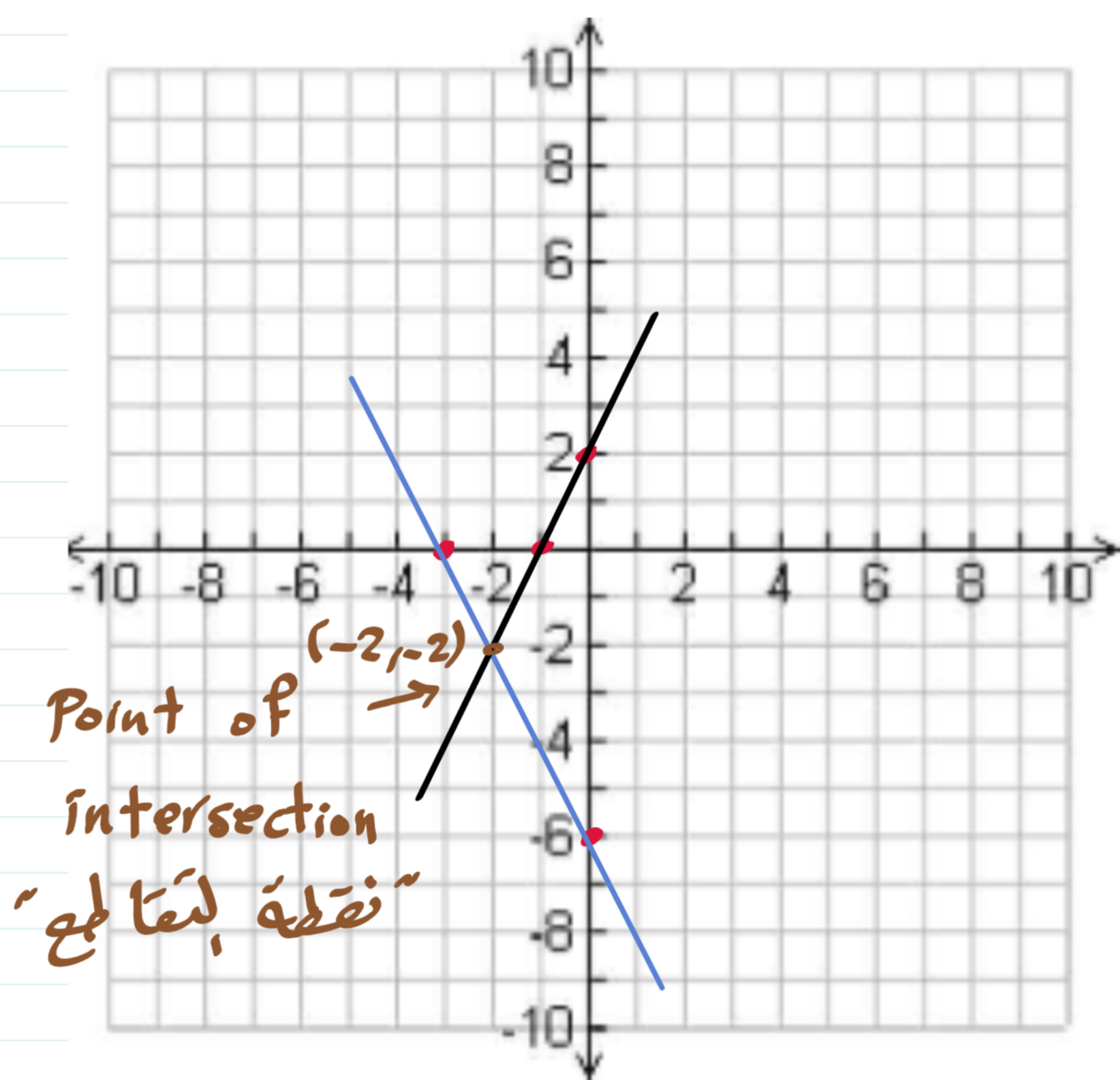
$$2x + 0 = -6$$

$$2x = -6$$

$$x = \frac{-6}{2}$$

$$x = -3$$

$$(-3, 0)$$



$$(c) \quad 2x + y = 4$$

$$4x - 3y = 3$$

$$2x + y = 4$$

$$x=0$$

$$2(0) + y = 4$$

$$y = 4$$

$$(0, 4)$$

$$y=0$$

$$2x + 0 = 4$$

$$2x = 4$$

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

$$(2, 0)$$

$$4x - 3y = 3$$

$$x=0$$

$$4(0) - 3y = 3$$

$$-3y = 3$$

$$y = \frac{3}{-3} = -1$$

$$(0, -1)$$

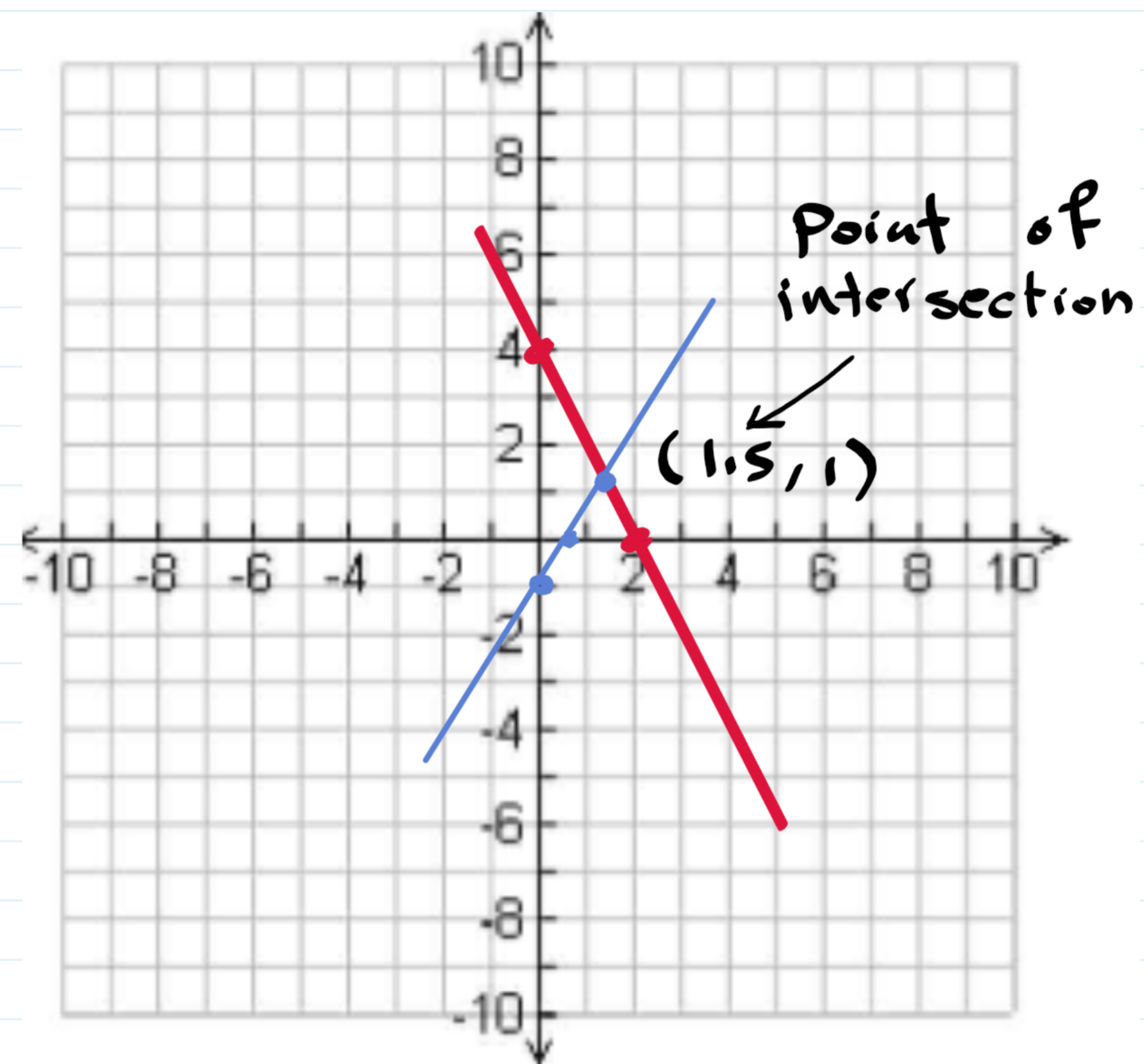
$$y=0$$

$$4x - 3(0) = 3$$

$$4x = 3$$

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

$$\left(\frac{3}{4}, 0\right)$$



7. State the value of the slope and y intercept for each of the following lines:

$$(a) \quad y = 5x + 9$$

$$\text{slope} = 5$$

$$y \text{ intercept} = 9$$

$$(d) \quad -x + y = 4$$

$$y = x + 4$$

$$\text{slope} = 1$$

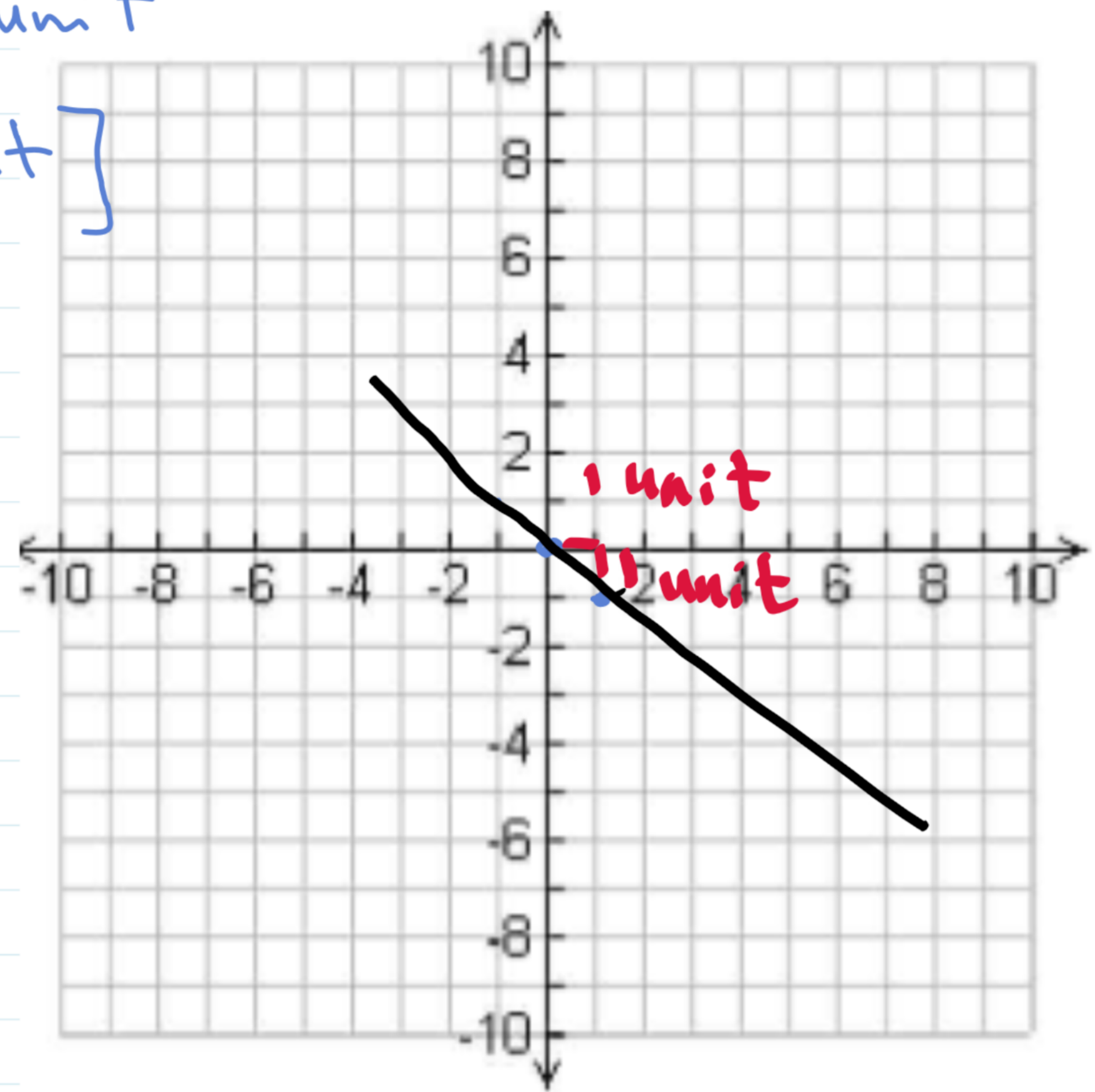
$$y \text{-intercept} = 4$$

8. Use the slope-intercept approach to produce a rough sketch of the following lines:

(a) $y = -x$

slope = -1 [As x increase by 1 unit
y decrease by 1 unit]

y-intercept = 0



(b) $x - 2y = 6$

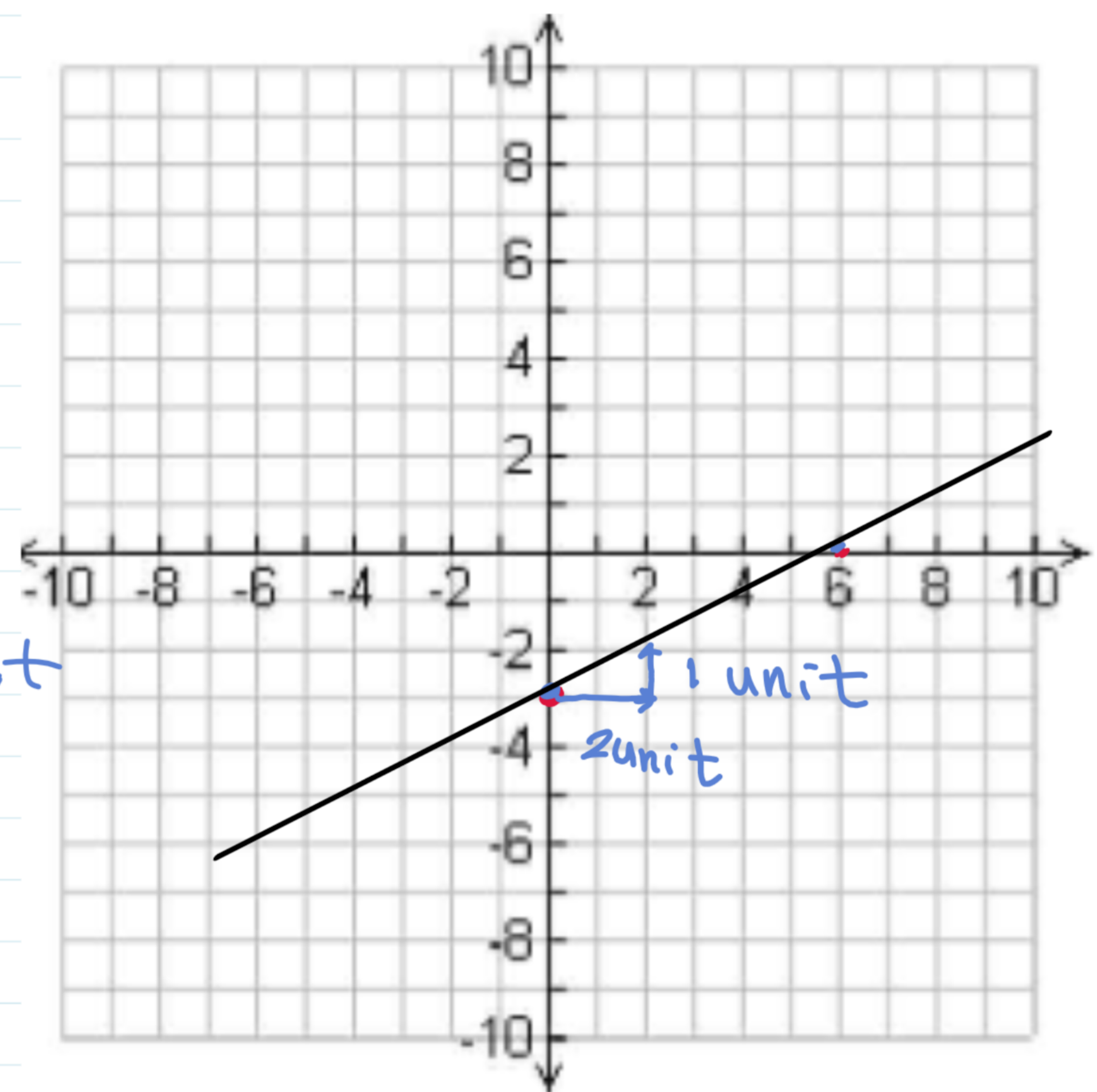
$$-2y = -x + 6$$

$$y = \frac{-x}{-2} + \frac{6}{-2}$$

$$y = \frac{1}{2}x - 3$$

slope = $\frac{1}{2}$ [As x increase by 1 unit
y increase by $\frac{1}{2}$ unit]

y-intercept = -3



- لوچه لریقه اعره

[As x increase by 2 units
y increase by 1 unit]

Which of the following points lie on the line $3x - 5y = 25$?

$(5, -2), (10, 1), (-5, 0), (5, 10), (-5, 10), (0, -5)$

$$(5, -2): 3(5) - 5(-2) \\ 15 + 10 = 25 \quad \checkmark$$

$$(10, 1): 3(10) - 5(1) \\ 30 - 5 = 25 \quad \checkmark$$

$$(-5, 0): 3(-5) - 5(0) \\ -15 \neq 25 \quad \times$$

$$(5, 10): 3(5) - 5(10) \\ 15 - 50 = -35 \quad \times$$

$$(-5, 10): 3(-5) - 5(10) \\ -15 - 50 = -65 \quad \times$$

$$(0, -5): 3(0) - 5(-5) \\ = 25 \quad \checkmark$$

Exercise 1.3*

4. Identify the two lines in the following list which are parallel:

- (a) $3x + 5y = 2$ (b) $5x - 3y = 1$ (c) $5x + 3y = 13$

$$a) y = -\frac{3}{5}x + 2$$

$$\text{slope} = -\frac{3}{5}$$

$$b) y = \frac{5}{3}x - \frac{1}{3}$$

$$\text{slope} = \frac{5}{3}$$

$$c) y = -\frac{5}{3}x + \frac{13}{3}$$

$$\text{slope} = -\frac{5}{3}$$

موازی ہیں [اذا كان لهما نفس الميل] Slope

میل مختلف
No parallel lines
لا يوجد خطوط متوازية