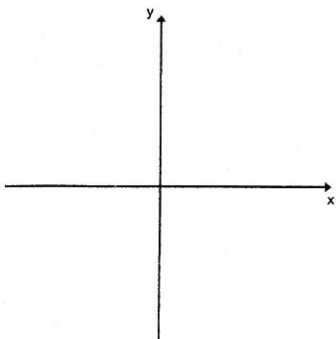
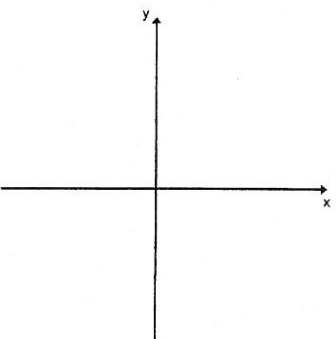
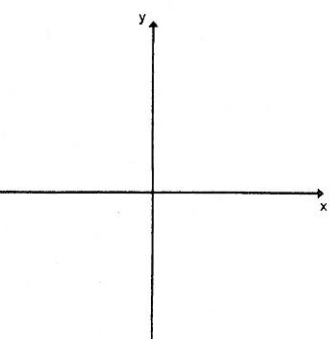


Paper and Pencil Sketching of Lines (Standard Form)

	<p>Graph 1 $3x + 4y = 12$</p> <p>Label x intercept and y intercept</p>	<p>Show work to find the intercepts here</p> <p>What is the slope? $m =$ _____</p> <p>What is the y intercept? $(0, \text{_____})$ $b =$ _____</p> <p>What is the x intercept? $(\text{____}, 0)$</p> <p>Convert to slope intercept form _____</p>
-----------------------------------------------------------------------------------	---------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	<p>Graph 2 $5x - 3y = 30$</p> <p>Label x intercept and y intercept</p>	<p>Show work to find the intercepts here</p> <p>What is the slope? $m =$ _____</p> <p>What is the y intercept? $(0, \text{_____})$ $b =$ _____</p> <p>What is the x intercept? $(\text{____}, 0)$</p> <p>Convert to slope intercept form _____</p>
------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	<p>Graph 3 $-2x + 3y = 18$</p> <p>Label x intercept and y intercept</p>	<p>Show work to find the intercepts here</p> <p>What is the slope? $m =$ _____</p> <p>What is the y intercept? $(0, \text{_____})$ $b =$ _____</p> <p>What is the x intercept? $(\text{____}, 0)$</p> <p>Convert to slope intercept form _____</p>
-------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

In mathematics, when you truly understand what is going on, you can use letters to greatly speed up the process.

$$y = \frac{-A}{B}x + \frac{C}{B}$$

$$\left(\frac{C}{A}, 0\right)$$

$$\left(0, \frac{C}{B}\right)$$

$$\left(x, \frac{-A}{B}x + \frac{C}{B}\right)$$

$$\left(\frac{-B}{A}y + \frac{C}{A}, y\right)$$

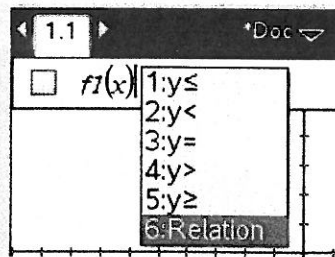
Technology Tips

How do I confirm the answers to the previous page with Desmos Apps?

Mr. Hickman wrote a slider-based program so you can check your work [Graphing Lines CRASH COURSE](#)

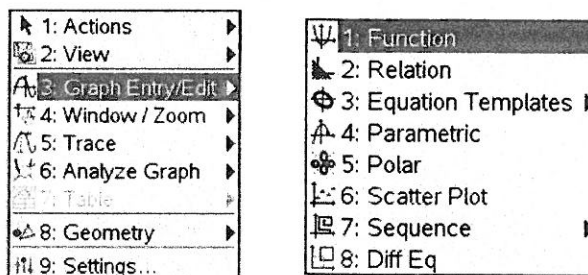
How do I enter a standard form line on TI Nspire?

- Add Graph Page
- On Graph Entry Line delete "=" sign to get this pull-down menu
- Select 6: Relation
- Type Standard Form Line into this entry line



How do I rid of relation graph entry edit on graphs page?

- Press Menu to get this pull-down menu
- Select 3: Graph Entry/Edit to get the next pull-down menu
- Select 1: Function



Here are my expectations/hopes

1. You can determine the intercepts of a standard form line quickly and accurately (be careful with signs, division, and remember to plot x intercept on x axis and y intercept on y axis)
2. You sketch this line on a blank grid
3. You change the graph entry to relation on TI Nspire
4. You enter standard form line on TI Nspire
5. You determine slope intercept version using any method you wish
6. Convert standard form line into slope intercept form
7. You change graph entry back to function
8. You plot your slope intercept form on same grid as standard form (If they lie on top of each other everything is good)

	Graph 4 $-2x - 5y = 0$	Show work to find the intercepts here
	Label x intercept and y intercept	What is the slope? $m = \underline{\hspace{2cm}}$
		What is the y intercept? $(0, \underline{\hspace{1cm}})$ $b = \underline{\hspace{2cm}}$
		What is the x intercept? $(\underline{\hspace{1cm}}, 0)$
		Convert to slope intercept form $\underline{\hspace{4cm}}$

Many think Graph 4 is the most challenging..... I don't, you just have to remember how to plot points using slope!

Standard Form Lines

$$3x + 4y = 12$$

$$3x + 4(0) = 12$$

$$3x = 12$$

$$\frac{3x}{3} = \frac{12}{3}$$

$$x = 4$$

$(4, 0)$
x-intercept

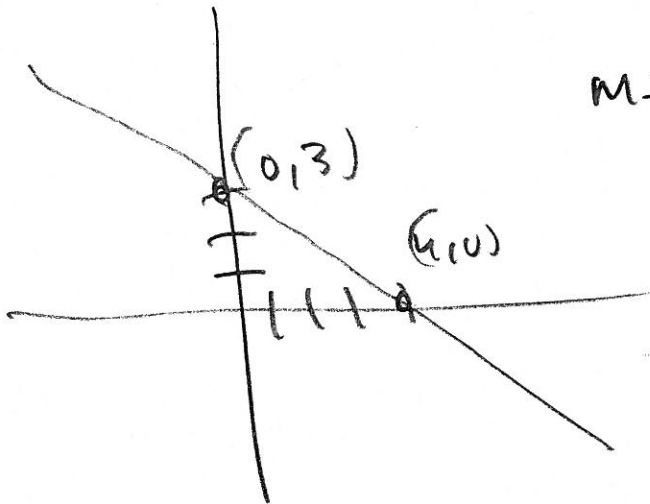
$$3(0) + 4y = 12$$

$$4y = 12$$

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

$$y = 3$$

$(0, 3)$
y-intercept



$$m = \frac{\Delta y}{\Delta x} = -\frac{3}{4}$$

$$y = mx + b$$

$$y = -\frac{3}{4}x + 3$$

negative slope ↘

$$5x - 3y = 30$$

$$5x - 3(0) = 30$$

$$5x = 30$$

$$\frac{5x}{5} = \frac{30}{5}$$

$$x = 6$$

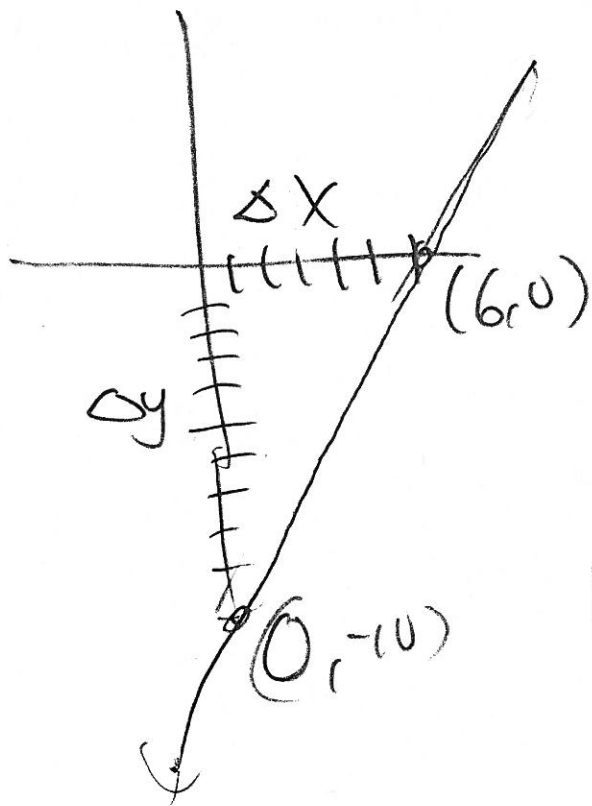
$(6, 0)$
x intercept

$$5(0) - 3y = 30$$

$$-3y = 30$$

$$\frac{-3y}{-3} = \frac{30}{-3}$$

$y = -10$
y intercept



positive slope

$$m = \frac{\uparrow 10}{6}$$

$$b = -10$$

$$y = mx + b$$

$$y = \frac{10}{6}x - 10$$

$$y = \frac{5}{3}x - 10$$

$$-2x + 3y = 18$$

$$-2x + 3(0) = 18$$

$$-2x = 18$$

$$\frac{-2x}{-2} = \frac{18}{-2}$$

$$x = -9$$

x intercept
 $(-9, 0)$

$$-2(0) + 3y = 18$$

$$3y = 18$$

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

$$y = 6$$

$$(0, 6)$$

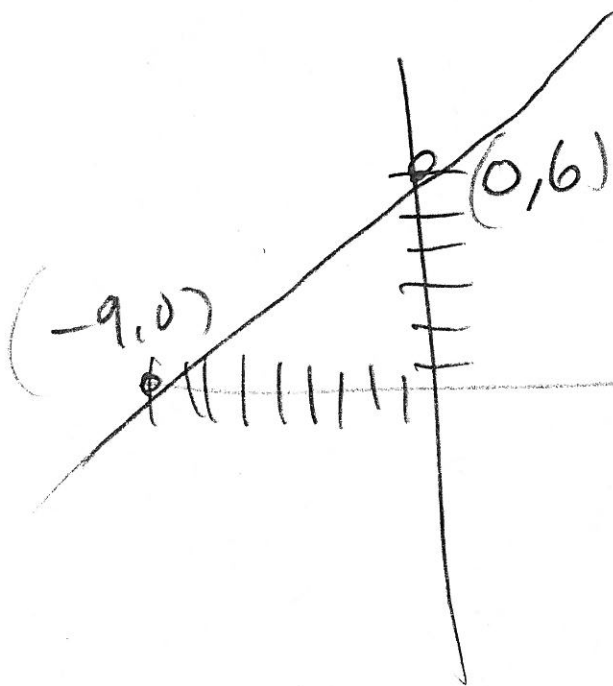
y intercept $\rightarrow b$

$$m = + \leftarrow \text{positive slope}$$
$$\frac{6}{9}$$

$$y = mx + b$$

$$y = \frac{6}{9}x + 6$$

$$y = \frac{2}{3}x + 6$$



$$-2x - 5y = 0$$

→ must pass through
(0,0)

$$\begin{array}{r} -2x - 5y = 0 \\ +5y + 5y \\ \hline \end{array}$$

$$-2x = 5y$$

$$\frac{-2x}{5} = \frac{5y}{5}$$

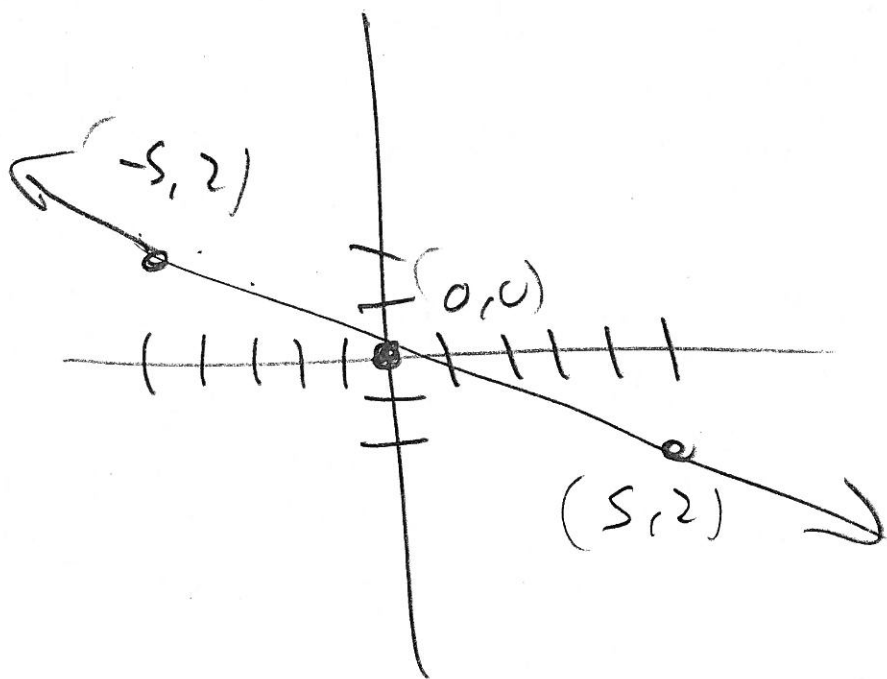
$$y = -\frac{2}{5}x + 0$$

x-intercept

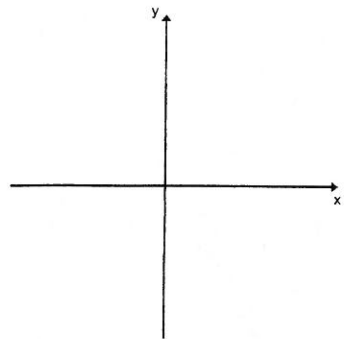
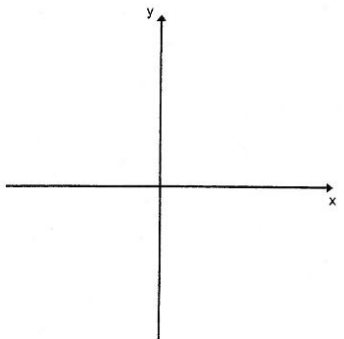
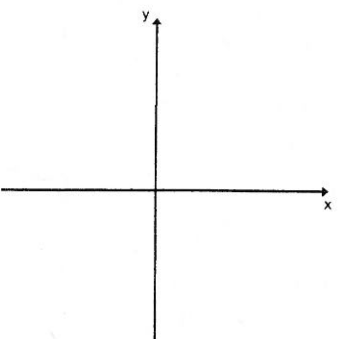
(0,0)

y-intercept

(0,0)



Paper and Pencil Sketching of Lines (Slope Intercept Form)

	<p>Graph 1 $y = \frac{4}{3}x - 12$</p> <p>Label y intercept and another implied point</p>	<p>Show work to find the intercepts here</p> <p>What is the slope? $m = \underline{\hspace{2cm}}$</p> <p>What is the y intercept? $(0, \underline{\hspace{2cm}})$ $b = \underline{\hspace{2cm}}$</p> <p>What is the x intercept? $(\underline{\hspace{2cm}}, 0)$</p>
	<p>Graph 2 $y = \frac{-7}{3}x + 21$</p> <p>Label y intercept and another implied point</p>	<p>Show work to find the intercepts here</p> <p>What is the slope? $m = \underline{\hspace{2cm}}$</p> <p>What is the y intercept? $(0, \underline{\hspace{2cm}})$ $b = \underline{\hspace{2cm}}$</p> <p>What is the x intercept? $(\underline{\hspace{2cm}}, 0)$</p>
	<p>Graph 3 $y = -5x - 10$</p> <p>Label y intercept and another implied point</p>	<p>Show work to find the intercepts here</p> <p>What is the slope? $m = \underline{\hspace{2cm}}$</p> <p>What is the y intercept? $(0, \underline{\hspace{2cm}})$ $b = \underline{\hspace{2cm}}$</p> <p>What is the x intercept? $(\underline{\hspace{2cm}}, 0)$</p>

In mathematics, when you truly understand what is going on, you can use letters to greatly speed up the process.

$$-mx + y = b$$

$$y = m\left(x - \frac{b}{m}\right)$$

$$\left(\frac{-b}{m}, 0\right)$$

$$(0, b)$$

$$(x, mx + b)$$

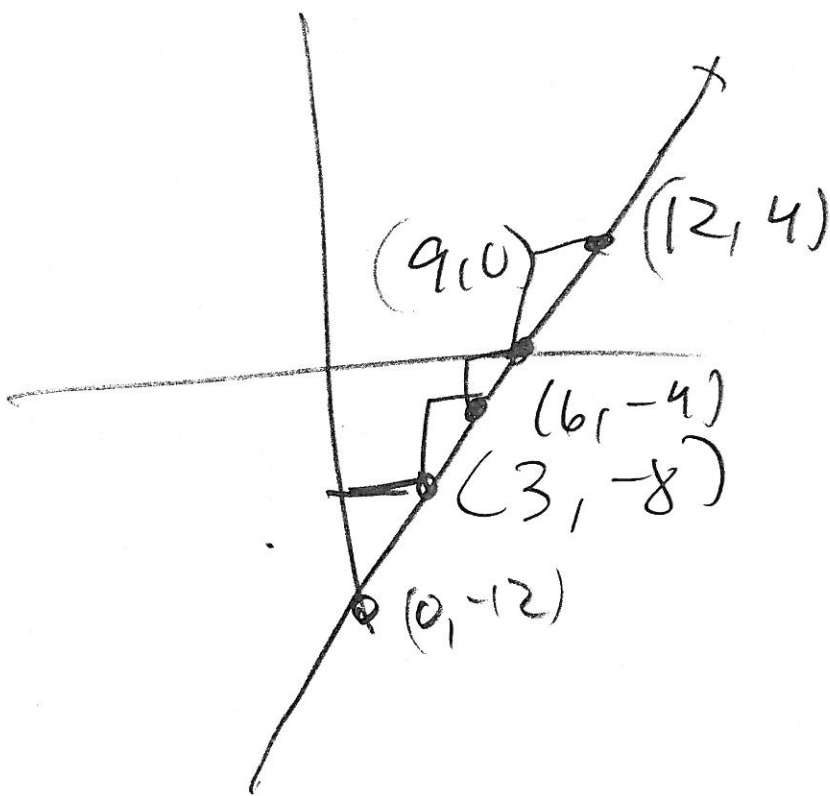
$$\left(\frac{1}{m}y - \frac{b}{m}, y\right)$$

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

$$\Delta y = 4$$

$$\Delta x = 3$$

y intercept (0, -12)



x	y
0	-12
3	-8
6	-4
9	0

x intercept (9, 0)

$$0 = \frac{4}{3}x - 12$$

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

OR

$$0 = \frac{4}{3}x - 12 \quad | \times 3$$

$$0 = 4x - 36$$

$$36 = 4x$$

$$1x = \frac{36}{4} = 9$$

$$x = \frac{12}{\left(\frac{4}{3}\right)} = 12 \cdot \left(\frac{3}{4}\right)$$

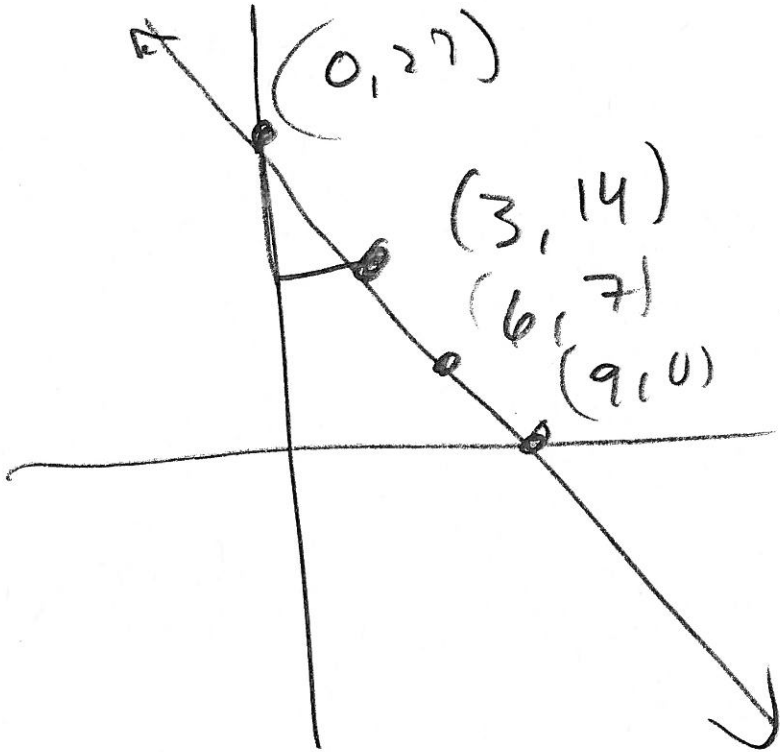
$$x = \frac{36}{4} = 9$$

$$y = -\frac{7}{3}x + 21$$

(0, 21) y-intercept

$$m = -\frac{7}{3} \leftarrow \Delta y$$

$$3 \leftarrow \Delta x$$



x	y
0	21
+3	14
+3	7
+3	0

X-intercept (9, 0)

$$0 = -\frac{7}{3}x + 21$$

$$\frac{7}{3}x = 21$$

$$x = \frac{21}{\left(\frac{7}{3}\right)} = 21 \cdot \frac{3}{7}$$

$$x = \frac{63}{7} = 9$$

OR

$$\frac{0}{3} = -\frac{7}{3}x + 21$$

$$0 = -7x + 63$$

$$7x = 63$$

$$x = \frac{63}{7}$$

$$x = 9$$

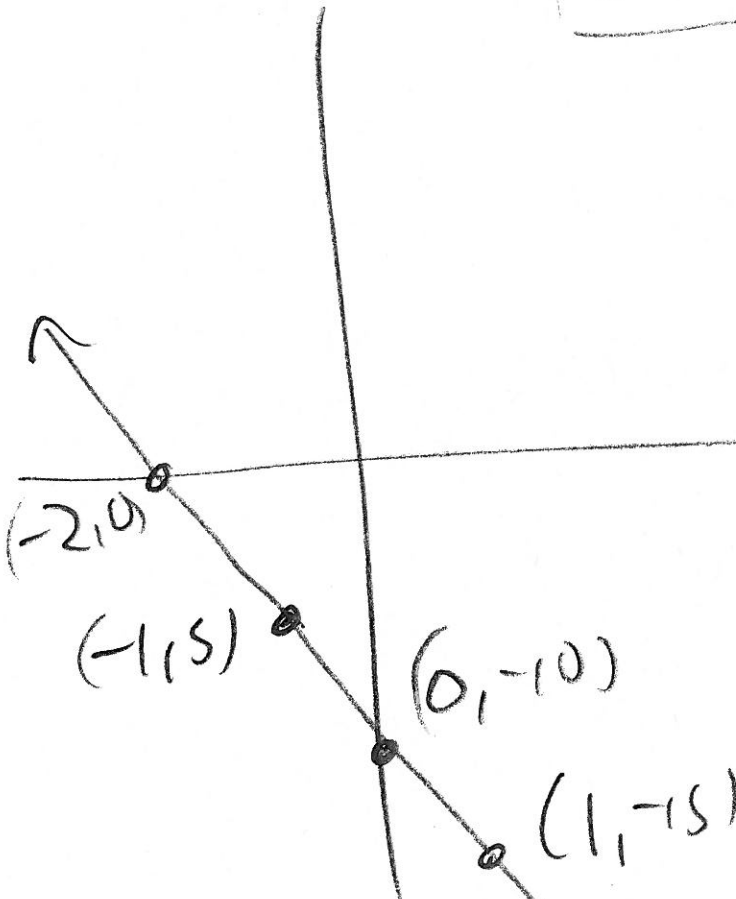
$$y = -5x - 10$$

$$m = \frac{-\Delta y}{\Delta x}$$



$$b = -10$$

$$\boxed{\text{yint } (0, -10)}$$



x	y
-4	10
-3	5
-2	0
-1	-5
0	-10
1	-15

$$0 = -5x - 10$$

$$5x = -10$$

$$x = \frac{-10}{5}$$

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

$$\boxed{\text{xint } (-2, 0)}$$

$$y = -\frac{9}{17}x + 0$$

y-intercept = x-intercept = $(0, 0)$

