

Essential Question: How can we graph linear relationships using x and y-intercepts?

Do Now: Complete the table for the following function and graph the relationship.

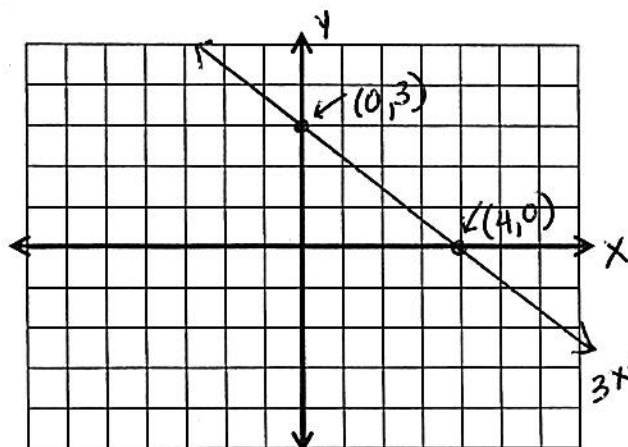
$3x + 4y = 12$

$$\begin{array}{r} 3x + 4y = 12 \\ -3x \qquad -3x \\ \hline \end{array}$$

x	-4	0	4
y	6	3	0

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

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



Identify the points where the graph intersects the x and y-axes.

x-intercept: 4

y-intercept: 3

Graphing Linear Functions Using Intercepts



Think about this...

How many points are needed to graph a line?

How can we use x and y-intercepts to graph a linear function?

The **y-intercept** is the y-coordinate of the point where the graph intersects the y-axis. (0,y) To find the y-intercept, let $x = 0$ and solve for y.

The **x-intercept** is the x-coordinate of the point where the graph intersects the x-axis. (x,0) To find the x-intercept, let $y = 0$ and solve for x.

Finding the x-intercept $(\underline{x}, 0)$
 \uparrow
 $y = 0$

$$\begin{aligned} 3x + 4y &= 12 \\ 3x + 4(0) &= 12 \\ 3x &= 12 \\ x &= 4 \end{aligned}$$

x-intercept is 4

Finding the y-intercept $(0, \underline{y})$
 \uparrow
 $x = 0$

$$\begin{aligned} 3x + 4y &= 12 \\ 3(0) + 4y &= 12 \\ 4y &= 12 \\ y &= 3 \end{aligned}$$

y-intercept is 3

Making Quick Graphs Using X and Y intercepts

1. $y = x + 2$

x intercept = -2

y intercept = 2

x-int (y=0)

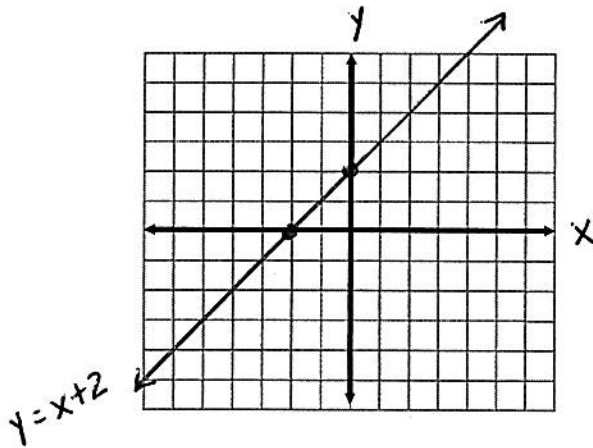
$0 = x + 2$

$-2 = x$

y-int (x=0)

$y = 0 + 2$

$y = 2$



2. $4x + 5y = 20$

x intercept = 5

y intercept = 4

x-int (y=0)

$4x + 5(0) = 20$

$4x = 20$

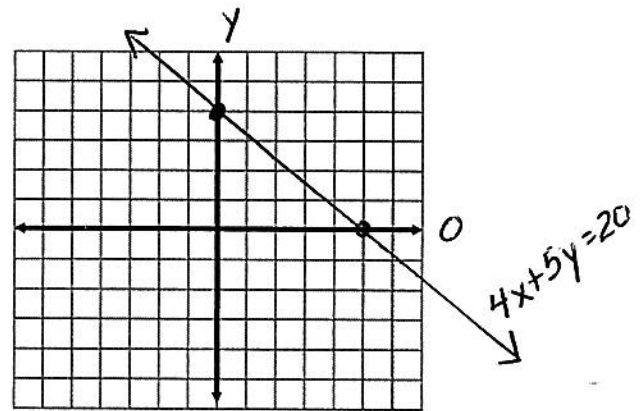
$x = 5$

y-int (x=0)

$4(0) + 5y = 20$

$5y = 20$

$y = 4$



3. $\frac{2}{3}y = 4 - \frac{1}{2}x$

x-int (y=0)

$\frac{2}{3}(0) = 4 - \frac{1}{2}x$

$0 = 4 - \frac{1}{2}x$

$-4 = -\frac{1}{2}x$

$(-2)(-4) = (-\frac{1}{2}x)(-2)$

$8 = x$

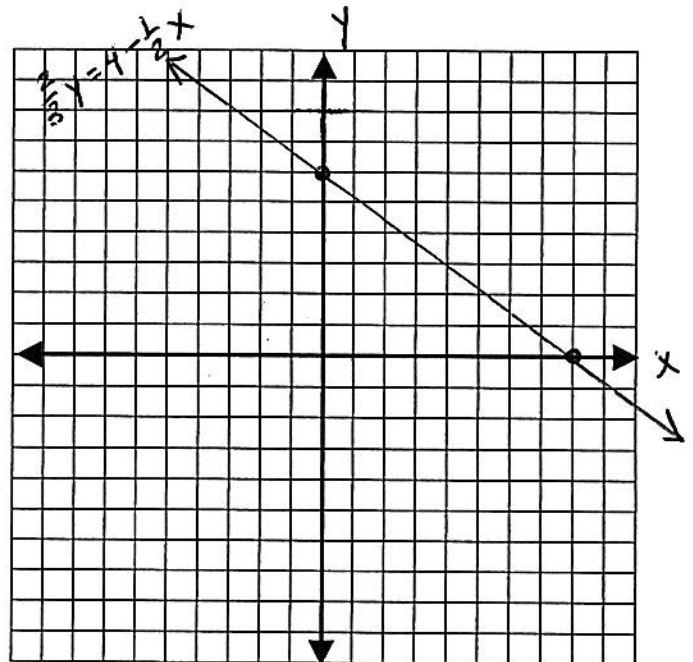
y-int (x=0)

$\frac{2}{3}y = 4 - \frac{1}{2}(0)$

$\frac{2}{3}y = 4$

$\frac{3}{2}(\frac{2}{3}y) = 4(\frac{3}{2})$

$y = 6$



The **TAKEAWAY**

We can make quick graphs of linear functions by finding the
x and y intercepts