GRAPHING LINES USING INTERCEPTS

x-intercept- the x-coordinate of a point where a graph crosses the x-axis

- To find the x-intercept, substitute 0 for y and solve for y.

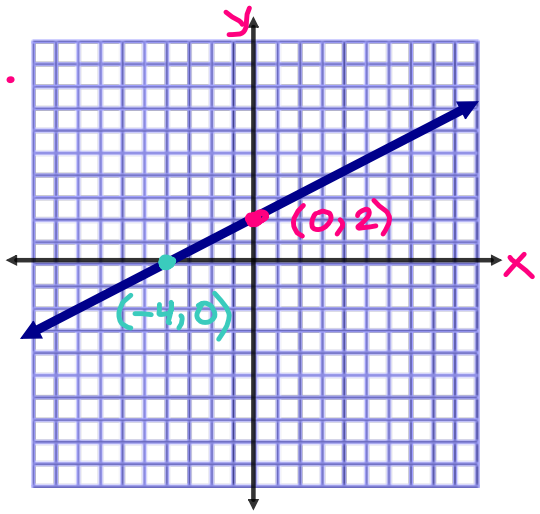
y-intercept- the y-coordinate of a point where a graph crosses the y-axis

- To find the y-intercept, substitute 0 for x and solve for x.

EXAMPLES

Identify the x- and y-intercepts of each graph below.

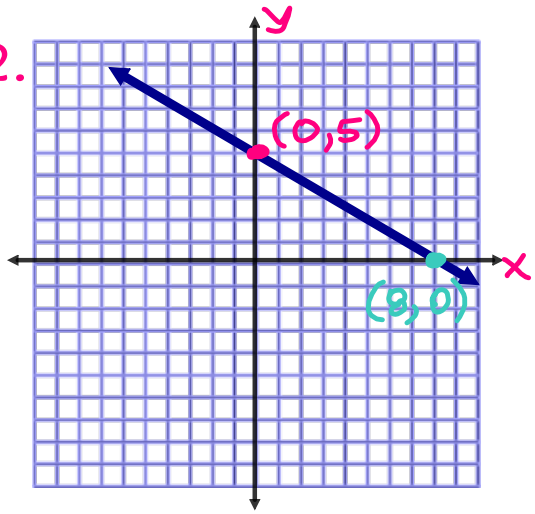
1.



x-int = -4

y-int = 2

2.



x-int = 8

y-int = 5

Find the x-intercept (plug 0 in for y) of each equation.

3. $5x + 2y = 20$

$5x + 2(0) = 20$

$\frac{5x}{5} = \frac{20}{5}$

$x = 4$

x-int = 4

4. $2x - 3y = 6$

$2x - 3(0) = 6$

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

$x = 3$

x-int = 3

Find the y-intercept (plug 0 in for x) of each equation.

5. $5x + 2y = 20$

$5(0) + 2y = 20$

$\frac{2y}{2} = \frac{20}{2}$

$y = 10$

y-int = 10

6. $2x - 3y = 6$

$2(0) - 3y = 6$

$\frac{-3y}{-3} = \frac{6}{-3}$

$y = -2$

y-int = -2

Find the x- and y-intercepts of the equations below.

7. $3x - 4y = 12$

x-int

$3x - 4(0) = 12$

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

$x = 4$

x-int = 4

y-int

$3(0) - 4y = 12$

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

$y = -3$

y-int = -3

8. $-5x + 4y = 2$

x-int

$-5x + 4(0) = 2$

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

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

or

$x = -0.4$

x-int = -0.4

y-int

$-5(0) + 4y = 2$

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

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

or

$y = 0.5$

y-int = 0.5

MAKING A QUICK GRAPH

STEP 1: Find the intercepts.

STEP 2: Draw a coordinate plane that includes intercepts.

STEP 3: Plot the intercepts and draw a line through them.

9. Graph the equation of $3x + 2y = 12$ using intercepts.

x-int

$3x + 2(0) = 12$

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

$x = 4$

x-int = 4

(4, 0)

y-int

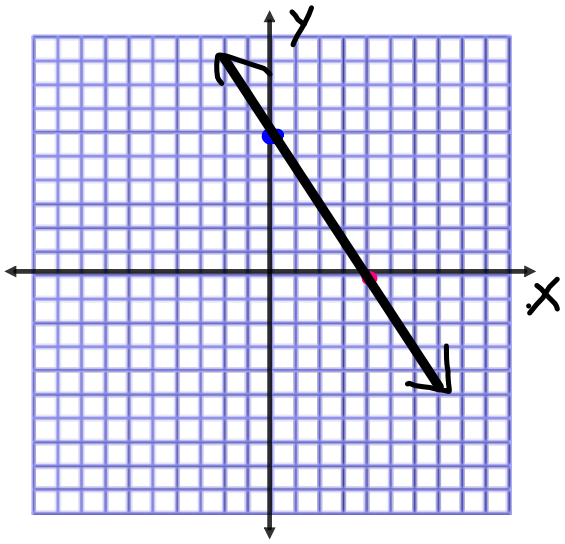
$3(0) + 2y = 12$

$\frac{2y}{2} = \frac{12}{2}$

$y = 6$

y-int = 6

(0, 6)



10. Graph the equation of $4x - 5y = 20$ using intercepts.

x-int

$4x - 5(0) = 20$

$\frac{4x}{4} = \frac{20}{4}$

$x = 5$

x-int = 5

(5, 0)

y-int

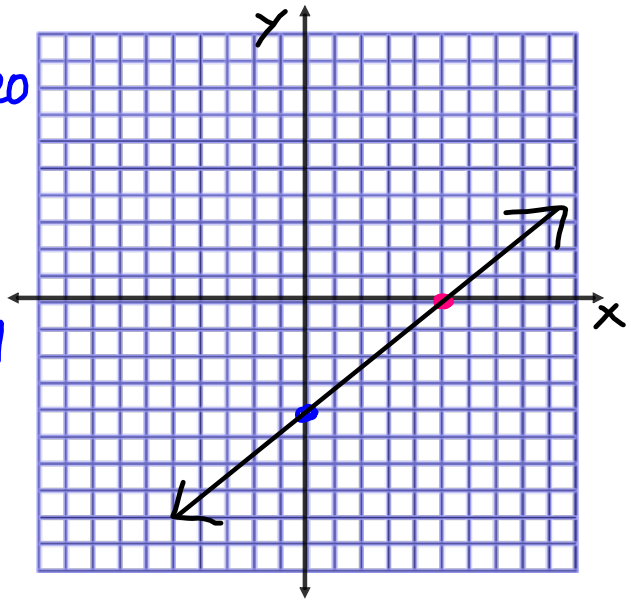
$4(0) - 5y = 20$

$\frac{-5y}{-5} = \frac{20}{-5}$

$y = -4$

y-int = -4

(0, -4)



11. You make and sell decorative bows. Small bows are sold for $3 and large bows are sold for $5. You want to earn $60 per week. This situation can be modeled by the equation $3x + 5y = 60$, where x is the number of small bows and y is the number of large bows.

a) Find the intercepts of the graph.

b) Graph the equation.

c) Give three possibilities for the number of each type of bow you can sell to earn $60.

x-int

$3x + 5(0) = 60$

$\frac{3x}{3} = \frac{60}{3}$

x-int = 20

y-int

$3(0) + 5y = 60$

$\frac{5y}{5} = \frac{60}{5}$

y-int = 12

(0,12) → 0 small bows, 12 large bows

(10,6) → 10 small bows, 6 large bows

(5,9) → 5 small bows, 9 large bows