## 4.3: Graph a Line Using $x$ and $y$ intercepts

Goals *Identify $x$ and $y$ intercepts by looking at a graph
*Identify $x$ and $y$ intercepts from an equation
*Graph a line using $x$ and $y$ intercepts
*Interpret meaning of $x$ and $y$ intercepts


O $=x$ - intercepts
$\square=y$ - intercepts
$\underline{\boldsymbol{x}}$-intercept: the place where the line hits the $x$-axis. The $y$-coordinate is always 0 .
$\underline{\boldsymbol{y}}$-intercept: the place where the line hits the $y$-axis. The $x$-coordinate is always 0 .

Identify the $x$ and $y$ intercepts of the lines graphed.

$x$-intercept: $3, y$-intercept: 3

## Ex:



Ex:

$x$-intercep: 3, $y$-intercept: -4

Ex:

$x$-intercept: $-1 / 2, y$-intercept: -1

## Graphing a line using $x$ and $y$ intercepts:

1. Find the $x$ - intercept by letting __y $\quad y=0$ $\qquad$ .
(since we noticed this is true for all $x$ - intercepts)
$2 x+5 y=10$
$2 x+5(0)=10$
$\frac{2 x}{2}=\frac{10}{2}$
$x=5$
2. Graph the $x$-intercept you just found. Since you know this is the point where the line hits the $\qquad$ $x$-axis $\qquad$ , your only options for graphing are to move _left $\qquad$ or $\qquad$ right $\qquad$ .
3. Find the $y$-intercept by letting $\quad$ _ $x=0$ $\qquad$ in the original equation.

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2 x+5 y=10
$$

(since we noticed this is true for all $y$-intercepts)
$2(0)+5 y=10$ $\frac{5 y}{5}=\frac{10}{5}$
$y=2$
5. Solve for $y(0, \#)$
6. Graph the $y$ - intercept you just found. Since you know this is the point where the line hits the $\qquad$ $y$-axis $\qquad$ ,
your only options are to move $\qquad$ up $\qquad$ or $\qquad$ down $\qquad$ .
7. Connect with a ruler.


Find the $x$ and $y$ intercepts of each equation and then graph the equation:

Ex: $3 x+2 y=6$
$x$-int: $2, y$-int: 3


Ex: $-3 x+5 y=-15$
$x$-int: 5, $y$-int: -3


$$
\text { Ex: } 4 x-2 y=10
$$

$$
x \text {-int: } 2.5, y \text {-int: }-5
$$



Ex: $x+2 y=4$

$$
x \text {-int: } 4, y \text {-int: } 2
$$



Ex: You are helping plan an awards banquet for your school and you need to rent tables to seat 180 people. Tables come in two sizes. Small tables seat 4 people and large tables seat 6 people.
a) Let $x$ equal the number of small tables and $y$ equal the number of large tables. Write an equation to represent the situation.
$4 x+6 y=180$
b) Graph the equation.
$x$-int: 45; $y$-int: 30
c) What do the intercepts mean?

If using 0 small tables, then needs 30 large
If using 0 large tables, then need 45 small

d) Give 4 possible combinations of small and large tables you could
use. Look at the graph for easily identifiable points on the graph
30 large, 0 small
45 small, 0 large
30 small, 10 large
15 small, 20 large

Ex: You make and sell decorative bows. You sell small bows for $\$ 3$ and large bows for $\$ 5$. You want to earn $\$ 60$. Write an equation to represent the situation. Graph your equation. Give two possible combinations of small and large bows you could sell.
$3 x+5 y=60$
$x$-int: $20, y$-int: 12
10 small, 6 large
20 small, 0 large
0 small, 12 large


