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



x – intercept: the place where the line hits the x-axis. The y-coordinate is always 0.

<u>y - intercept</u>: 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



x-intercept: -3, *y*-intercept: 2





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



Graphing a line using x and y intercepts:

- 1. Find the *x* intercept by letting y = 0(since we noticed this is true for all x – intercepts)
- **2.** Solve for *x*. (#, 0)
- **3.** Graph the x intercept you just found. Since you know this is the point where the line hits the <u>x-axis</u>, your only options for graphing are to move <u>left</u> or <u>right</u>.
- 4. Find the y intercept by letting x = 0 in the original equation. 2x + 5y = 10(since we noticed this is true for all y – intercepts) 2(0) + 5y = 10
- Solve for y(0, #)5.
- 6. Graph the y intercept you just found. Since you know this is the point where the line hits the y-axis , your only options are to move <u>up</u> or <u>down</u>.

5y = 105

v = 2

5

7. Connect with a ruler.



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

Ex: 3x + 2y = 6

x-int: 2, *y*-int: 3



Ex: -3x + 5y = -15

x-int: 5, *y*-int: -3





x-int: 2.5, *y*-int: -5



Ex: x + 2y = 4

x-int: 4, *y*-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.

4x + 6y = 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.

3x + 5y = 60

x-int: 20, y-int: 12

10 small, 6 large 20 small, 0 large 0 small, 12 large

