In 2.3 we narrowed our view of functions to Linear functions and found 3 basic forms we can express a line. 1. Slope-intercept, 2. Standard form, 3. Point-Slope form. 2.3 focused on slope- intercept form. In this section we will look at Standard form of a line, consider the cases when lines are vertical and horizontal, look again at intercepts but when given different information.

Def: The **standard form of a line** is $ax+by=c$.

$$\frac{c}{b}$$

$$-\frac{a}{b}$$

The slope of this line will be \_\_\_\_\_\_\_\_ and the y-int will be \_\_\_\_\_\_\_ \_

Ex: Find the slope and both intercepts of the line:

1. $x+y=5$ $m=-1, y-int:\left(0,5\right),x-int:(5,0)$
2. $\frac{1}{2}y+\frac{1}{3}x=1$ $m=-\frac{2}{3},y-int:\left(0,2\right), y-int:(3,0)$
3. $y+2=7$ $m=0, y-int:(0,7), x-int:DNE$
4. $x+2=7$ $m=undefined, y-int:DNE, x-int:(0,7)$

## Vertical and Horizontal lines:

Graph the lines from above (c & d) or $y=2,x=2$ separately.

Use rise/run to calc. slopes of each.

Discuss the intercepts of each.

Summary:

## Horizontal lines:

Have the form: $y=a$

Have slope: 0

Have no x-int:

Have y-int.: $(0,a)$

## Vertical lines:

Have the form: $x=a$

Have slope: Undefined

Have x-int: $(a,0)$

Have no y-int.

## Graphing Using Intercepts:

Recall that in order to graph a line all we need is 2 points, a third is good to check with.

Also recall last time when we had slope intercept form all we had to do to graph a line was

1. Find intercept . (1 point)
2. Use the slope to find another point .

This time we have a form of a line that makes it really easy to find two points

1. Find x-int (let y=0) (1 point)
2. Find y-int (let x = 0) (2nd point)

How Do you find x int?

How do you find y-int?

Let y and x = 0 respectively

Ex: Graph the lines using intercepts:

1. $2y+3x=0$
2. $x+2y=2$
3. $2y+3x=6$
4. $y=2x+4$

## Solving Equations Graphically

We will discuss this topic when we get to chapter 3.