Graphing Linear Equations

In This Unit:

1. Slope-Intercept Form
2. Special Lines
3. Intercepts

No Bellwork
01/20/2012

Lesson 4.1
Slope-Intercept Form

What You Need to Know:

Slope-Intercept Form: $y=mx+b$, where m is slope and b is the y-intercept

Don't worry! You've already learned to write equations in slope-intercept form!! When you solve a formula for y, that's writing it in this form.

Always write an equation in slope-intercept form before you graph.

You always need the <u>SLOPE</u> and <u>Y-INTERCEPT</u> in order to graph.

Slope-Intercept Form

Write the equation in slope-intercept form. Then tell the slope and the y-intercept.

-x+y=6

-2x+y=-4

3x-y=1

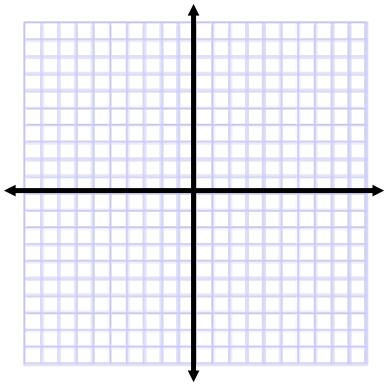
4x+2y=1

-9x+3y=-6

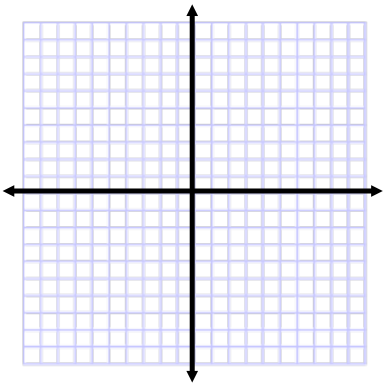
Slope-Intercept Form Cont.

Graph the equation. If necessary, write the equation in slope-intercept form first.

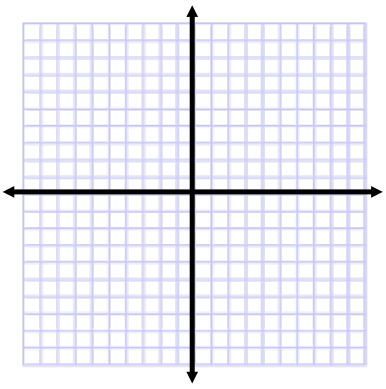
y=-3x+5



x+4y=4



x+3y-6=0



Homework Assignment

Worksheet
"Graphing Slope-Intercept Form"

Bellwork
01/23/2012

Write the equation in slope-intercept form. Then graph the line.

1. -2x-4y=12

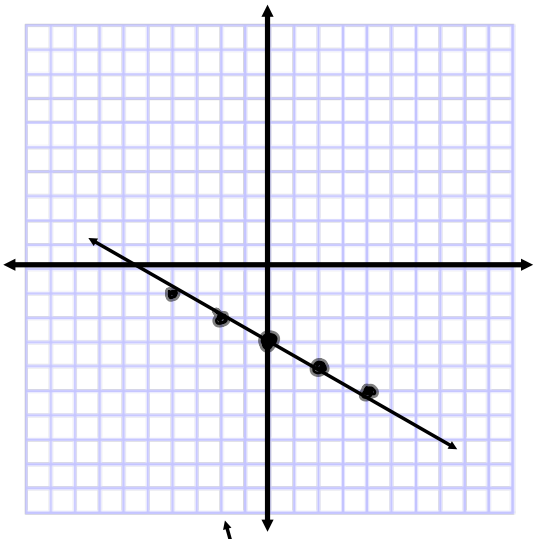
$+2x \quad +2x$

$\frac{-4y}{-4} = \frac{2x}{-4} + \frac{12}{-4}$

$y = -\frac{1}{2}x + (-3)$

$m = -\frac{1}{2}$

$b = -3$



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

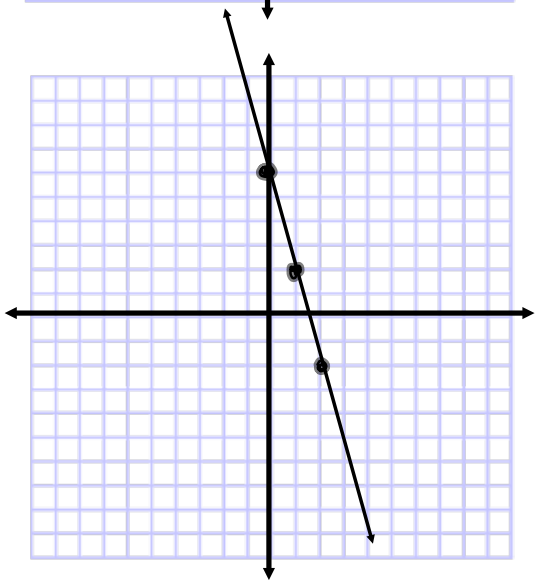
$-2x \quad -2x$

$\frac{1}{2}y = -2x + 3$ (·2)

$y = -4x + 6$

$m = -\frac{4}{1}$

$b = 6$



Lesson 4.2
Special Lines

What You Need to Know:

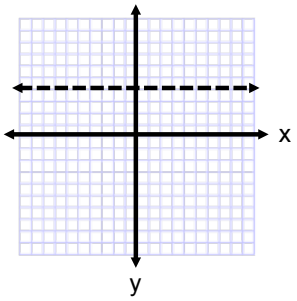
There are two types of special lines:
Horizontal Vertical

These lines are special because they have only ONE variable!

$y = 4$

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

Think of it like this:
Which axis does a horizontal line cross?



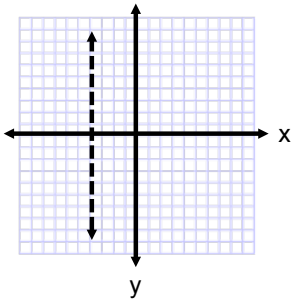
$y = \ldots$

So write a horizontal line as y=...

NOTE: horizontal lines have slope=0!

Which axis does a vertical line cross?

$x = \ldots$



So write a vertical line as x=...

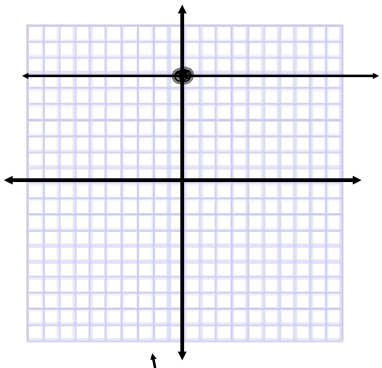
NOTE: vertical lines have slope=∅! $\emptyset$

Special Lines

Tell whether the line is horizontal, vertical, or neither. Then graph the equation.

y=7

Horizontal

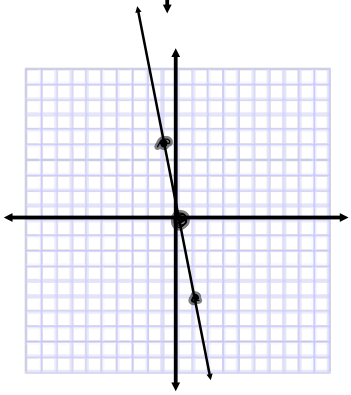


$y = mx + b$

y=-5x + 0

$m = -\frac{5}{1}$

$b = 0$

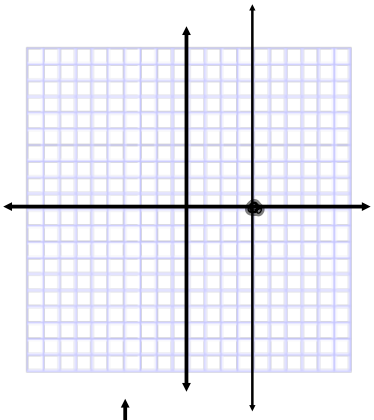


2x=8

$\frac{2x}{2} = \frac{8}{2}$

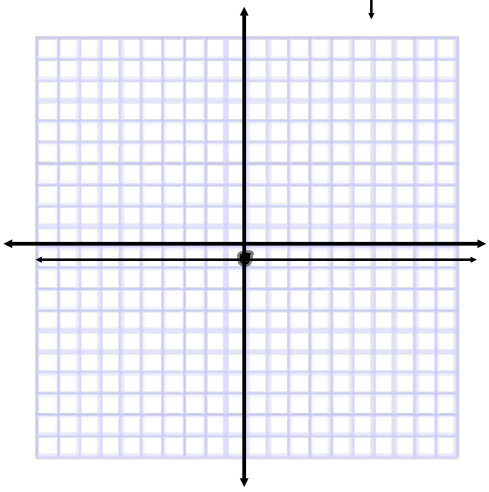
$x = 4$

Vertical



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

horizontal

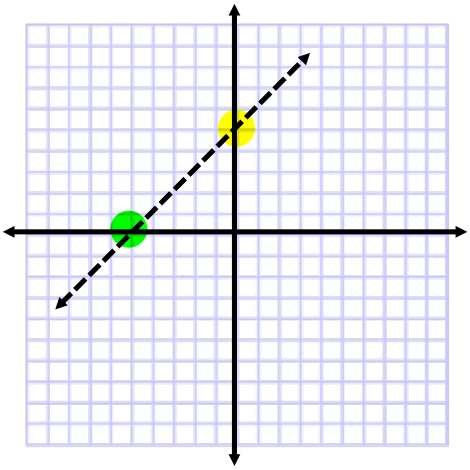


Lesson 4.3
Intercepts, Zeros, Solutions

What You Need to Know:

What are intercepts?

Points where the line crosses the x and y-axis!



Here's how to find them:

x-intercept	y-intercept
Plug 0 in for y!	Plug 0 in for x!
(,0)	(0,)
x, y	x, y

When using intercepts, you DON'T have to change the equation to slope-intercept form!

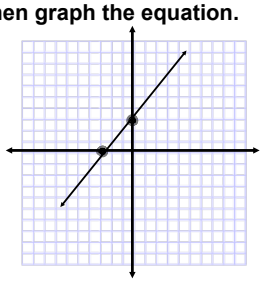
Now you know two ways of graphing:

1. **Slope-Intercept Form**
2. **Using Intercepts**

Intercepts, Zeros, Solutions

Find the intercepts [zeros] of the line. Then graph the equation.

y=x+3



x:

$y = x + 3$

$0 = x + 3$

$-3 \quad -3$

$x = -3$

(x, y)

$(-3, 0)$

y:

$y = x + 3$

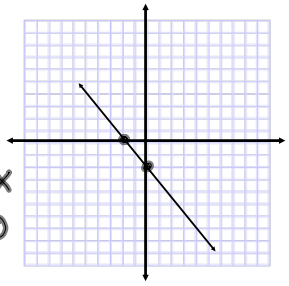
$y = 0 + 3$

$y = 3$

(x, y)

$(0, 3)$

y=-2-x



x:

$y = -2 - x$

$0 = -2 - x$

$+2 \quad +2$

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

$x = -2$

$(-2, 0)$

y:

$y = -2 - x$

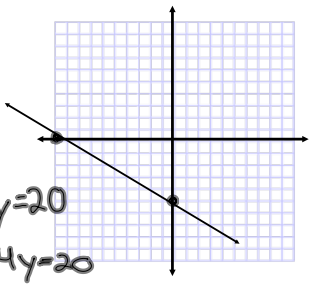
$y = -2 - 0$

$y = -2$

(x, y)

$(0, -2)$

-2x-4y=20



x:

$-2x - 4y = 20$

$-2x - 4(0) = 20$

$\frac{-2x}{-2} = \frac{20}{-2}$

$x = -10$

$(-10, 0)$

y:

$-2x - 4y = 20$

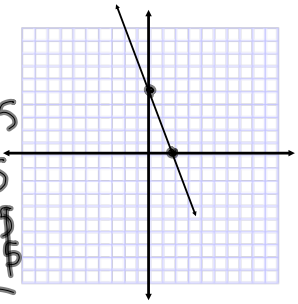
$-2(0) - 4y = 20$

$\frac{-4y}{-4} = \frac{20}{-4}$

$y = -5$

$(0, -5)$

3x=-y+5



x:

$3x = -y + 5$

$3x = -(0) + 5$

$\frac{3x}{3} = \frac{5}{3}$

$x = 5/3$ or $1\frac{2}{3}$

$(1\frac{2}{3}, 0)$

y:

$3x = -y + 5$

$3(0) = -y + 5$

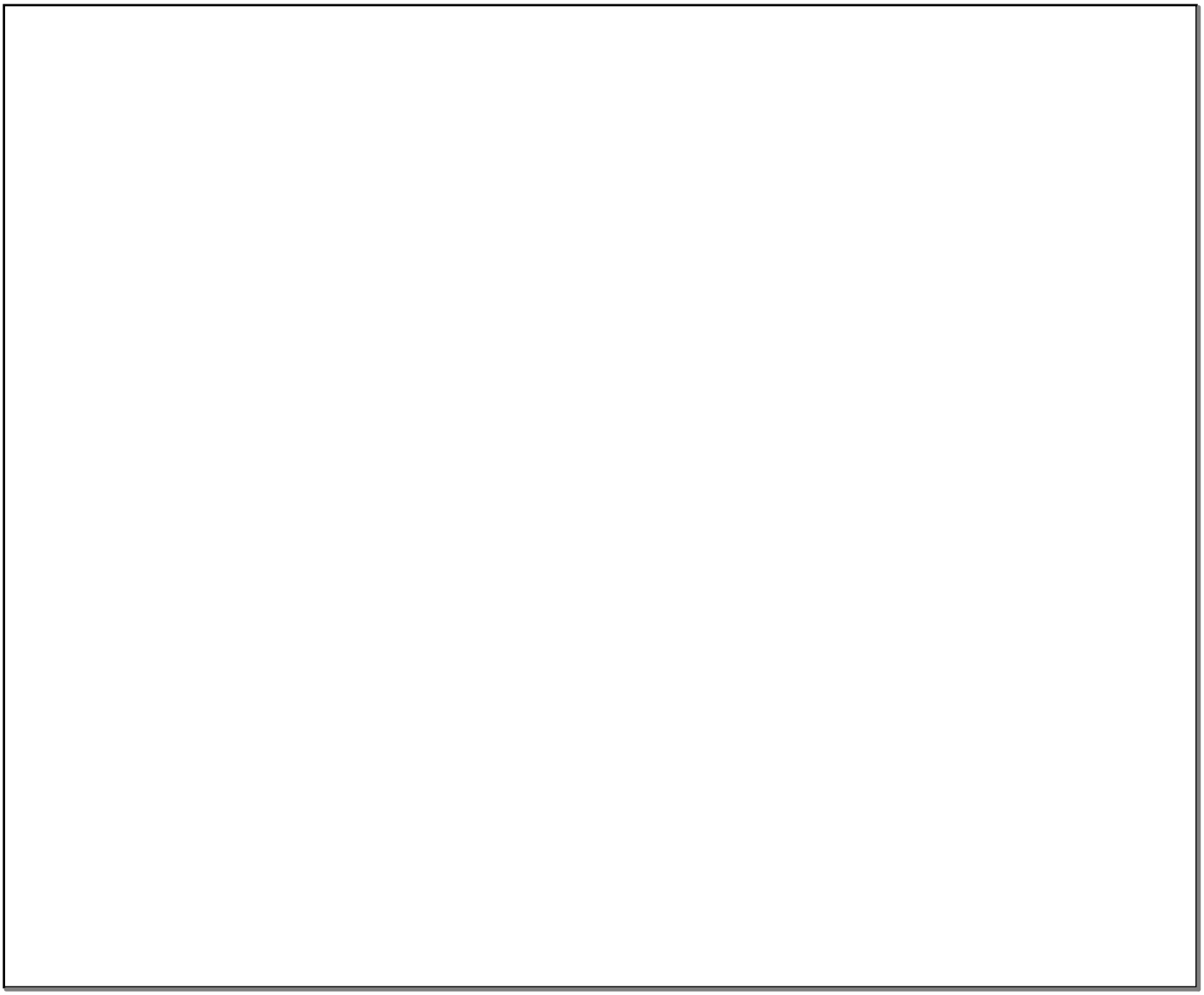
$0 = -y + 5$

$-5 \quad -5$

$\frac{-y}{-1} = \frac{+5}{-1}$

$y = 5$

$(0, 5)$

Homework Assignment

Worksheet
"Special Lines and Intercepts"