Chapter 3 - Linear Equations and Functions

3.4 Objective: To find the **equation** of a line given its **slope** and a **point** on the line, or **two points**.

Agenda

1) In groups- answer HW questions (10 min)

last night's HW
HW p. 116 #1, 5, 7, 13, 23, 39, 43

2) Do Now (10 min)

3) Point-Slope Form - How it works (10 min)
With me: Part A: 1 & 3, Part B: 1
In groups: Part A: 2 & 4, Part B: 2, 3, 4

4) Discover Slope of Parallel and Perpendicular Lines (10 min)

5) Exit Ticket (15 points) (10 min)

6) Practice Problems

p. 121 #1, 7, 13, 19, 23, 31
**Check answers in back. MUST SHOW CHECKS FOR FULL CREDIT

Chapter 3 - Linear Equations and Functions

3.4 Objective: To find the **equation** of a line
given its **slope** and a **point** on the line, or **two points**.

DO NOW

There are multiple ways to graph lines:

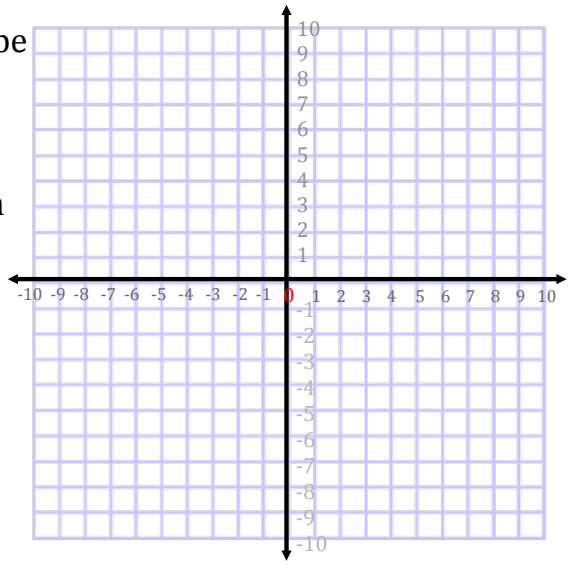
2 points	**1 point and slope**
2 intercepts	y-intercept and slope

1) Graph the line of $2x + y = 6$.

2) Graph the line through (1,4) with a slope of -2/1.

3) Graph the line through (-1, 8) and (4,-2)

4) Graph the line with a *y-intercept* of 6 and a slope of -2/1.



There are multiple forms for equations of lines.

Slope-Intercept Form	Standard Form	Point Slope Form
$y = m x + b$	$Ax + By = C$	$(y - y_1) = m (x - x_1)$
Slope =	*Slope =*	*Slope =*
Useful when given:	*Used to plot:*	*Useful when given:*
_____	_____	_____
_____	_____	_____
		or
		_____

Write the equation for the line above in the respective forms:

Slope-Intercept Form Standard Form Point Slope Form

Point Slope form: $y - y_1 = m(x - x_1)$

How does it work....

Part A) Find an equation of :

1) The line through (1, 3) with a slope of 2.

2) The line through (2, 1) with slope of -3

3) The line through (3, -2) and (2, -3)

a) find the slope:
m = _____ = _____ = _____

b) choose **either** point for equation

4) The line through (-4, 1) and (2, -2)

a) find the slope:
m = _____ = _____ = _____

b) choose **either** point for equation

Part B) Change the above equations into the respective form:

1) into standard form

2) into slope intercept form

3) into slope-intercept form

4) into standard form

DISCOVER: Slope of Parallel and Perpendicular Lines

Your group will be assigned one of the three equations.

1) **Graph** the equation on **graph paper**
   Answer: What is the **slope** of your equation?
   slope = _____

2) Use a **ruler** to draw a line that **looks PARALLEL** to the original line
   Answer: What is the **slope** of your "parallel" line?
   slope = _____

3) Use a **ruler** to draw a line that **looks PERPENDICULAR** to your original line
   Answer: What is the slope of your "perpendicular" line?
   slope = _____

4) Write an **equation** in **POINT-SLOPE FORM** for your two new lines

   Equation of Parallel Line: _____

   Equation of Perpendicular Line: _____

5) **Share** equations up on **board**.

Original Equation	Equations of Parallel Lines	Equations of Perpendicular Lines
1) $y = 1/2\,x + 3$		
2) $y = -3x + 6$		
3) $y = 4x - 2$		

Summarize:

Parallel lines // have slopes that are _____

Perpendicular lines ⊥ have slopes that are

_____

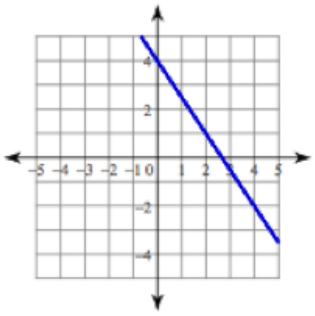
Practice Problems

Write the equation of each line given the following information. Use Whichever form is easiest.

1) Slope $= -\frac{3}{5}$, y-intercept $= 5$

2) through: $(4, -2)$, slope $= -1$

3)

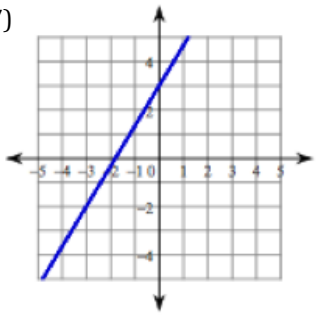


4) Slope $= 9$, y-intercept $= 4$

5) through: $(0, 4)$ and $(-1, -1)$

6) through: $(-2, 4)$, slope $= -\frac{1}{7}$

7)



8) through: $(-3, 2)$ and $(0, -1)$

p. 121 #1, 7, 13, 19, 23, 31

**Check answers in back. MUST SHOW CHECKS FOR FULL CREDIT

_____ out of 15

Exit Ticket

Name _____
Block_____

1) What is the slope? y = 3 - 4x

2) What is the slope? 9x - 3y = 27
(You should not have to rearrange the equation.)

3) What is the equation (in Point-Slope form) of a line which goes through the points (6, -1) and (3, 2) ?

4) a) What is the equation (in Point-Slope form) of a line with a slope of -3/2 and goes through the point (4, 5)?

b) What is the equation in Slope-Intercept form?

5) Given the following equation: **y = (1/3)x +4**
Label the following as **Parallel (//)** or **Perpendicular (⊥)**

a) y = -3x + 6 _____

b) y = 1/3 x + 2 _____

c) y - 6 = 1/3 (x + 2) _____

d) y + 2 = 3(x -4) _____

e) 6x + 2y = 8 _____

f) 3x - 9y = 10 _____