Writing Linear Equations

In This Unit:

1. Given slope and y-intercept
2. Given slope and a point
3. Given two points
4. Parallel and perpendicular lines

No Bellwork
01/26/2012

Lesson 5.1
Given Slope and y-Intercept

What You Need to Know:

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

REMEMBER: the slope ALWAYS comes before the x!

Given Slope and y-Intercept

Write an equation of the line in slope-intercept form.

Slope is -2, y-intercept is 5

Slope is 1, y-intercept is -4

Slope is 4, y-intercept is 0

Slope is 0, y-intercept is 2

A car charges a flat fee of $40 and an additional $.20 per mile to rent an automobile. Write an equation to model the total charge C (in dollars) in terms of *n*, the number of miles driven. Complete the table using the equation.

Miles (n)	50	100	200	300
Total (C)				

Lesson 5.2
Given Slope and a Point

What You Need to Know:

To write an equation, you need SLOPE and y-INTERCEPT.

A point is <u>not always</u> the y-intercept!

Use point-slope form when given a point and slope.

Is there an echo here?

****Point-Slope Formula: $y-y_1=m(x-x_1)$ when given (x_1,y_1)****

Remember: Slope is $\frac{\text{Rise}}{\text{Run}}$.

Given Slope and a Point

Write an equation of the line that passes through the point and has the given slope.

(1,-6), m=-2

(-3,-2), m=4

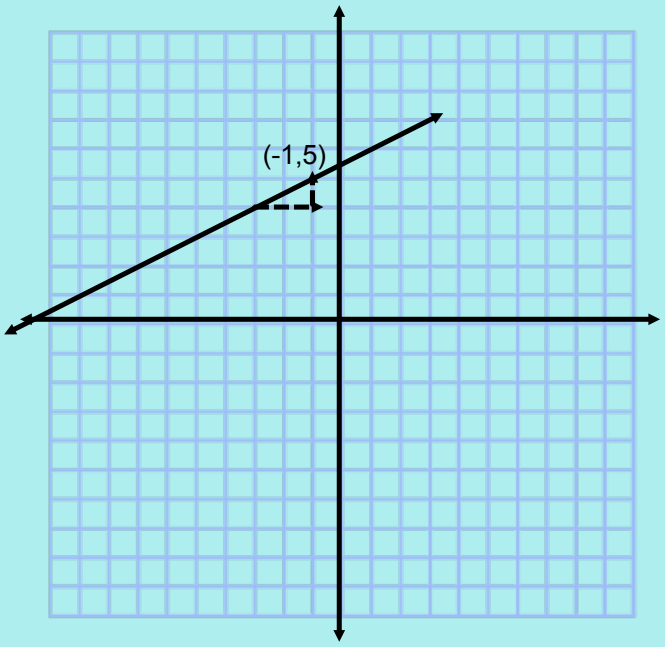
(4,5), m=-1

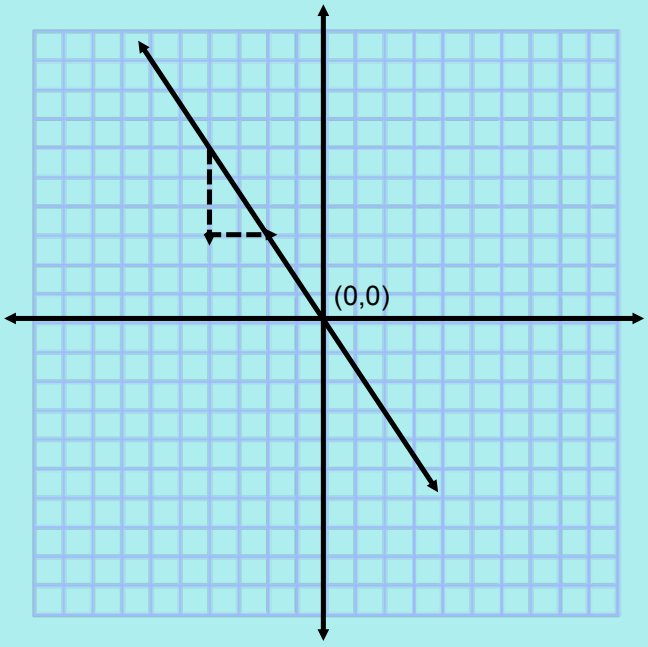
(-3,0), m=2

(2,6), m=0

Given Slope and a Point Cont.

Write an equation of the line shown.





Homework Assignment

Worksheet
"Writing Equations Given Slope and a Point"

Bellwork
01/27/2012

Use point-slope form to write the equation passing through the given point with the given slope.

1. (-3,6), m=-2

Lesson 5.3
Given Two Points

What You Need to Know:

To write an equation, you need _____and _____?

If you don't know the slope, you can find it using the slope formula!

You can use ANY of the two given points for the point-slope formula!

****Point-Slope Formula: $y-y^1=m(x-x^1)$ when given (x^1,y^1)****

Remember: Slope is $\frac{\text{Rise}}{\text{Run}}$.

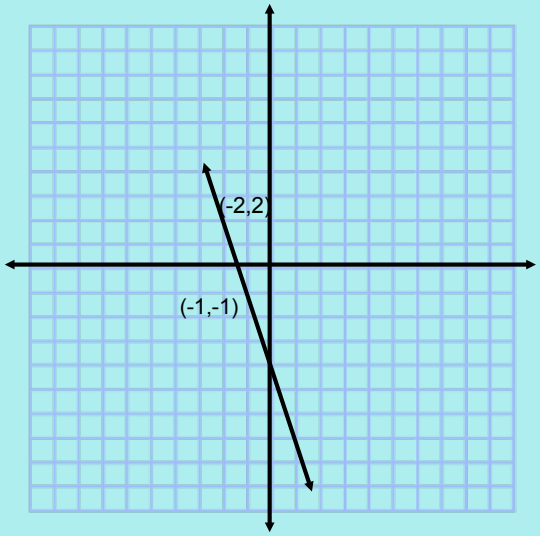
Given Two Points

Write an equation of the line that passes through the points.

(4,9), (1,6)

(0,7), (1,-1)

(-2,-3), (0,3)



Homework Assignment

Worksheet
"Writing Equations Given Two Points"

Bellwork
01/30/2012

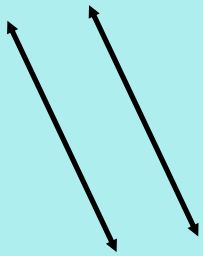
Use point-slope form to write the equation passing through the given points.

1. (1,-1), (2,-3)

Lesson 5.4
Parallel and Perpendicular Lines

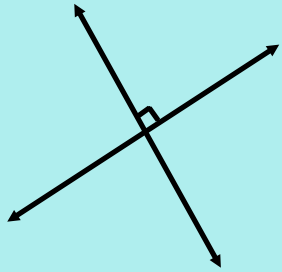
What You Need to Know:

Parallel Lines



Parallel lines NEVER intersect. Both lines have the SAME slope.

Perpendicular Lines



Perpendicular lines intersect at a right angle. The lines have OPPOSITE RECIPROCAL slope.

Perpendicular slopes are the opposite reciprocal of each other.

Example: $\frac{3}{4}$ **becomes** $-\frac{4}{3}$

Parallel Lines

Write an equation of the line parallel to the given line and passes through the given point.

y=4x-1, (2,3)

y=x+6, (-3,0)

y=-2x+3, (1,-1)

Perpendicular Lines

Write an equation of the line perpendicular to the given line and passes through the given point.

$y=2x-1$, (2,4)

$y=-\frac{1}{3}x+2$, (5,1)

$y=-4x+5$, (4,3)

Homework Assignment

Worksheet
"Writing Equations for Parallel and Perpendicular Lines"

Bellwork
01/31/2012

Write the equation parallel to the given line through the given point.

1. $y=\frac{1}{2}x-1$, (-6,3)

$m=\frac{1}{2}$, (-6,3)

$y-3=\frac{1}{2}(x+(+6))$

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

$+3 \qquad +3$

$\boxed{y=\frac{1}{2}x+6}$

Write the equation perpendicular to the given line through the given point.

2. $y=\frac{1}{3}x+7$, (2,-2)

~~$m=\frac{1}{3}$~~

$m=-3$, (2,-2)

$y-(-2)=-3(x-2)$

$y+2=-3x+6$

$-2 \qquad -2$

$\boxed{y=-3x+4}$

Lesson 5.5
Best-Fit Lines

What You Need to Know:

To find the best-fit line:

1. Plot the points.
2. Draw a line through the middle of the points.
3. Pick any two points ON the line.
4. Find the slope using the two points.
5. Write the equation using point-slope form.

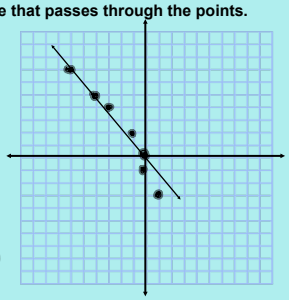
Point-Slope Formula: $y-y_1=m(x-x_1)$ when given (x_1,y_1)

Remember: Slope is $\frac{y_2-y_1}{x_2-x_1}$.

Best-Fit Lines

Write an equation of the line that passes through the points.

x	y
-6	7
-4	5
-3	4
-1	2
0	-1
1	-3



$(0,0),(-6,7)$

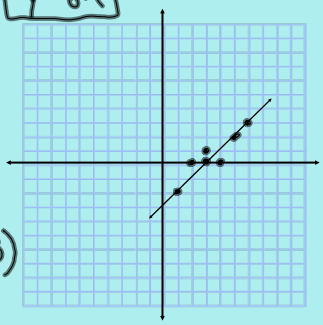
$m=\frac{7-0}{-6-0}=\frac{7}{-6}$

$m=-\frac{7}{6}, (0,0)$

$y-0=-\frac{7}{6}(x-0)$

$y=-\frac{7}{6}(x)$ $\boxed{y=-\frac{7}{6}x}$

x	y
1	-2
2	0
3	1
4	0
5	2
6	3



$(1,-2),(6,3)$

$m=\frac{3+(-2)}{6-1}$

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

$m=1, (1,-2)$

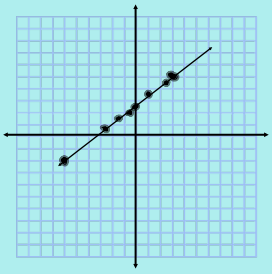
$y-(-2)=1(x-1)$

$y+2=1x-1$

$-2 \quad -2$

$\boxed{y=x-3}$

x	y
-2.75	0.5
-1.5	1.4
-0.5	2.0
0	2.5
1.0	3.6
2.5	4.5



$(-6,-2),(3,5)$

$m=\frac{5-(-2)}{3-(-6)}$

$\frac{5+2}{3+6}$

$m=\frac{7}{9}, (3,5)$

$y-5=\frac{7}{9}(x-3)$

$y-5=\frac{7}{9}x-\frac{7}{3}$

$+5 \quad +5$

$\boxed{y=\frac{7}{9}x+\frac{8}{3}}$

Homework Assignment

Worksheet 5.5
"Best-Fit Lines"