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

$y = mx + b$

$m = -2$

$b = 5$

$y = -2x + 5$

Slope is 1, y-intercept is -4

$m = 1$

$b = -4$

$y = 1x + (-4)$

$y = x + (-4)$

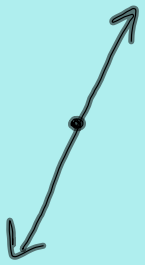
Slope is 4, y-intercept is 0

$m = 4$

$b = 0$

$y = 4x + 0$

$y = \frac{4}{1}x$



Slope is 0, y-intercept is 2

$m = 0$

$b = 2$

$y = 0x + 2$

$y = 0 + 2$

$y = 2$

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.

$C = 0.20n + 40$

Miles (n)	50	100	200	300
Total (C)	50	60	80	100

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!

(0, b)

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)****

m=

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.

$y-y_1=m(x-x_1)$

x_1, y_1

(1,-6), m=-2

$y-(-6)=-2(x-1)$

$y+6=-2x+2$

$-6 \quad -6$

$y=-2x+(-4)$

$y-y_1=m(x-x_1)$

x_1, y_1

(-3,-2), m=4

$y-(-2)=4(x-(-3))$

$y+2=4(x+3)$

$y+2=4x+12$

$-2 \quad -2$

$y=4x+10$

$y-y_1=m(x-x_1)$

x_1, y_1

(4,5), m=-1

$y-5=-1(x-4)$

$y-5=-1x+4$

$+5 \quad +5$

$y=-1x+9$

$y-y_1=m(x-x_1)$

x_1, y_1

(-3,0), m=2

$y-0=2(x-(-3))$

$y-0=2(x+3)$

$y=2x+6$

x_1, y_1

(2,6), m=0

$y-6=0(x-2)$

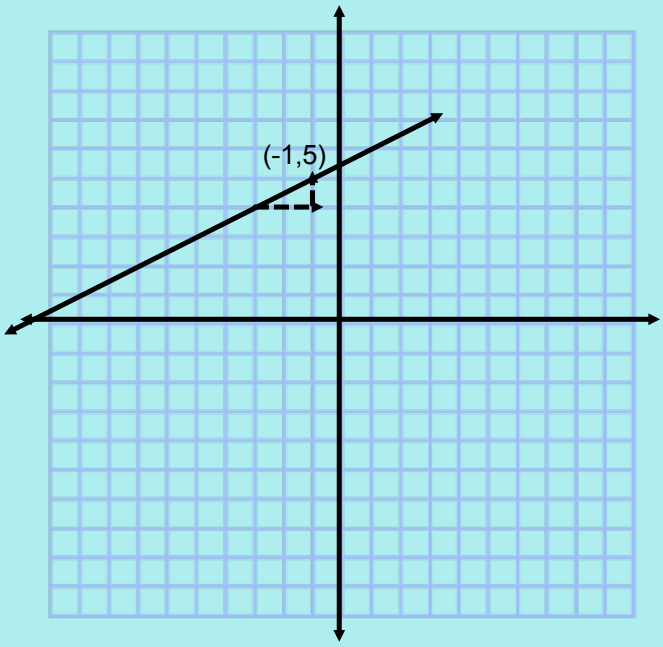
$y-6=0$

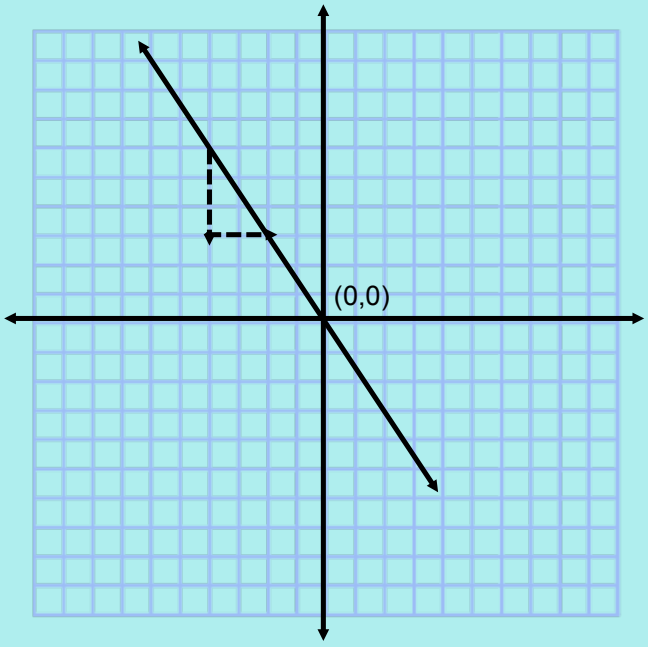
$+6 \quad +6$

$y=6$

Given Slope and a Point Cont.

Write an equation of the line shown.





Homework Assignment

Worksheet
"Writing Equations Given Slope and a Point"

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 $\frac{\text{Rise}}{\text{Run}}$.

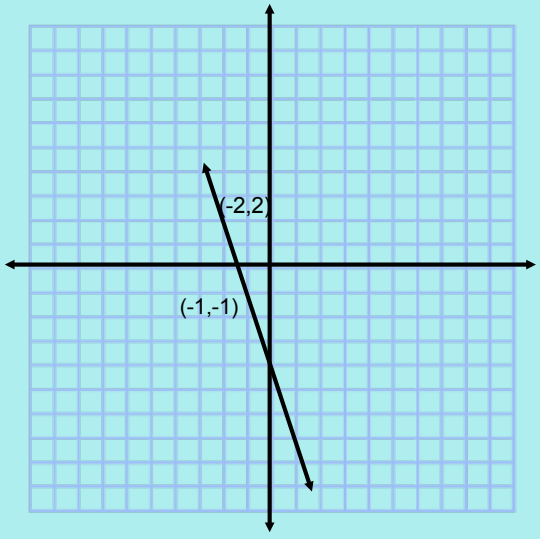
Given Two Points

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

(4,9), (1,6)

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

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



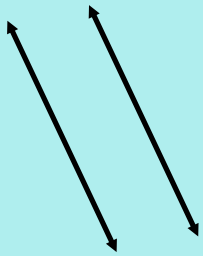
Homework Assignment

Worksheet
"Writing Equations Given Two Points"

Parallel and Perpendicular Lines

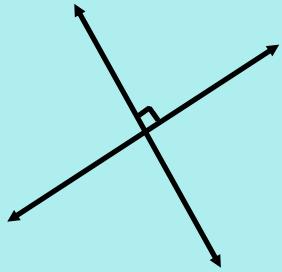
What You Need to Know:

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 and Perpendicular 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)

Parallel and Perpendicular Lines Cont.

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"

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.

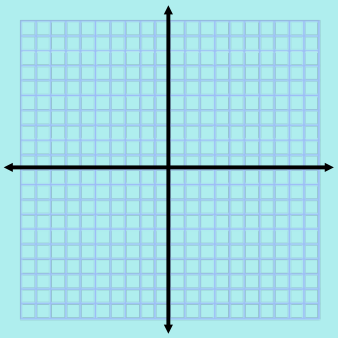
Point-Slope Formula: $y-y_1=m(x-x_1)$ when given (x_1,y_1)

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

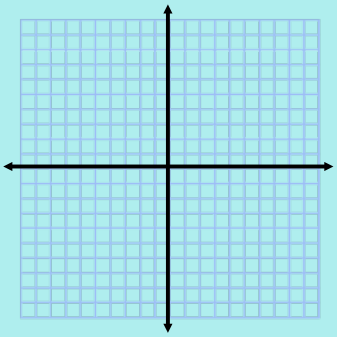
Best-Fit Lines

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

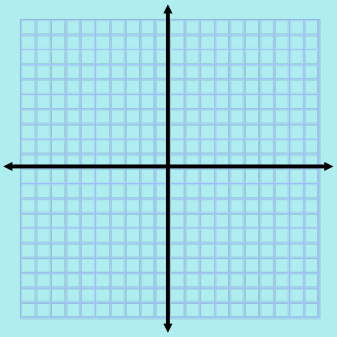
x	y
1	3
2	5
3	8
4	9
5	11
6	12



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



x	y
0	0.8
1.1	2.2
1.9	2.9
2.5	3.6
3.1	4.0
4.3	5.3



Homework Assignment

Worksheet
"Best-Fit Lines"