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

Given Slope and a Point

Write an equation of the line that passes through the point and has the given slope.
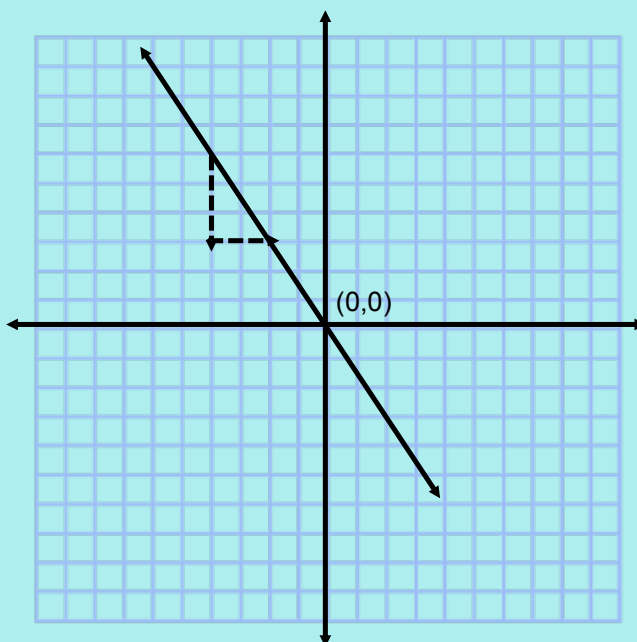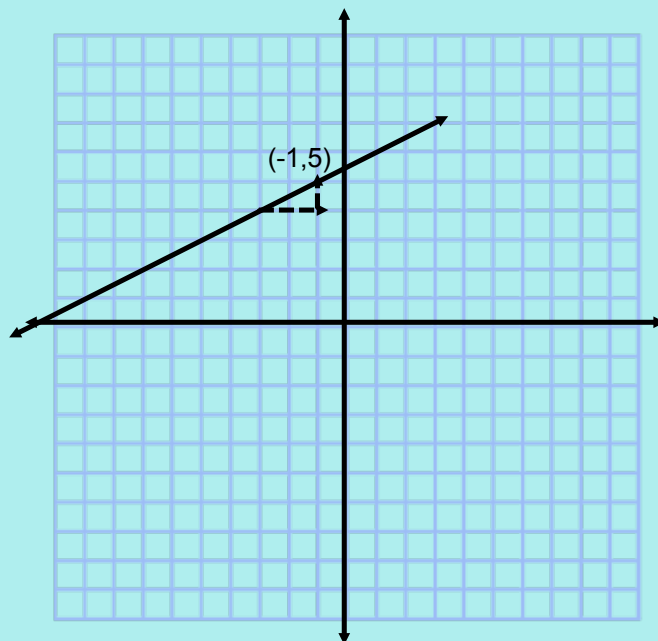
(1,-6), m=-2

(-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.

(-1,5)

(0,0)

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

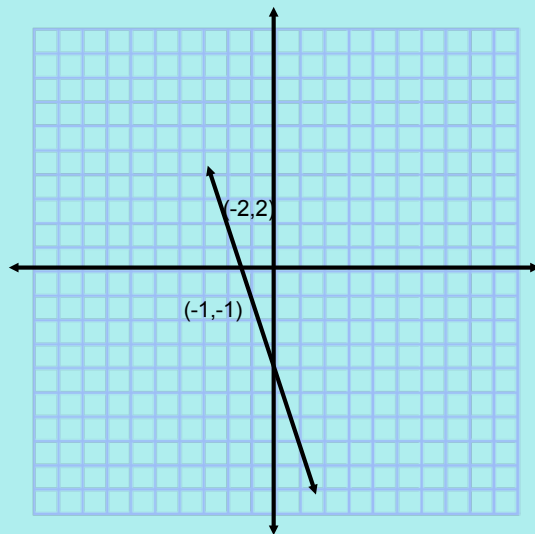# Given Two Points

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

(4,9), (1,6)

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

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

(-2,2)

(-1,-1)

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.

x y

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

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

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

$m = -2$

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

$y + 1 = -2x + 2$
$ -1 -1$

$\boxed{y = -2x + 1}$

Lesson 5.4
Parallel and Perpendicular Lines

What You Need to Know:

Parallel Lines

Perpendicular Lines
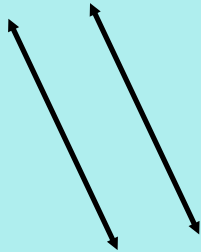
Parallel lines NEVER intersect. Both lines have the SAME slope.
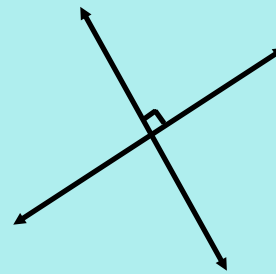
Perpendicular lines intersect at a right angle. The lines have OPPOSITE RECIPROCAL slope.

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)

$$m=4, (2,3)$$
$$y-3=4(x-2)$$
$$y-3=4x-8$$
$$+3 \qquad +3$$
$$y=4x+(-5)$$

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

$$m=1, (-3,0)$$
$$y-0=1(x-(-3))$$
$$y=1(x+3)$$
$$y=x+3$$

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

$$m=-2, (1,-1)$$
$$y-(-1)=-2(x-1)$$
$$y+1=-2x+2$$
$$-1 \qquad -1$$
$$y=-2x+1$$

Perpendicular Lines

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

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

$m = 2$

$m = -\frac{1}{2}, (2,4)$

$y - 4 = -\frac{1}{2}(x - 2)$

$y - 4 = -\frac{1}{2}x + 1$
$+4 \qquad\qquad +4$

$\boxed{y = -\frac{1}{2}x + 5}$

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

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

$m = 3, (5,1)$

$y - 1 = 3(x - 5)$
$y - 1 = 3x - 15$
$+1 \qquad\qquad +1$

$\boxed{y = 3x + (-14)}$

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

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

$m = \frac{1}{4}, (4,3)$

$y - 3 = \frac{1}{4}(x - 4)$

$y - 3 = \frac{1}{4}x - 1$
$+3 \qquad\qquad +3$

$\boxed{y = \frac{1}{4}x + 2}$

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.
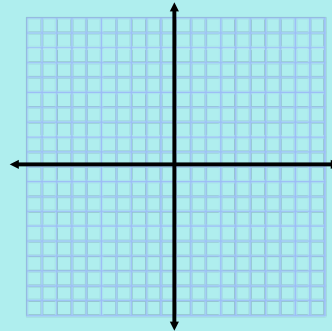5. Write the equation using point-slope form.

Point-Slope Formula: $y - y_1 = m(x - x_1)$ when given (x_1, y_1)
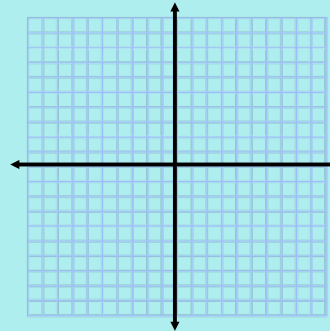
Remember: Slope is $\dfrac{y_2 - y_1}{x_2 - x_1}$.

Best-Fit Lines

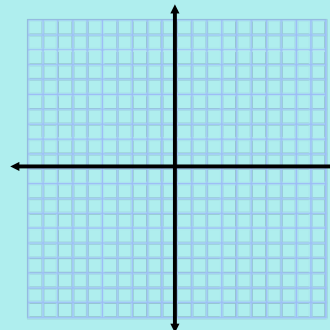**Write an equation of the line that passes through the points.**

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"