

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	$\frac{10}{0}$	$\frac{20}{0}$	$\frac{30}{0}$
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 not always the y-intercept!

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

****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.

$$(1, -6), m = -2$$

$$(-3, -2), m = 4$$

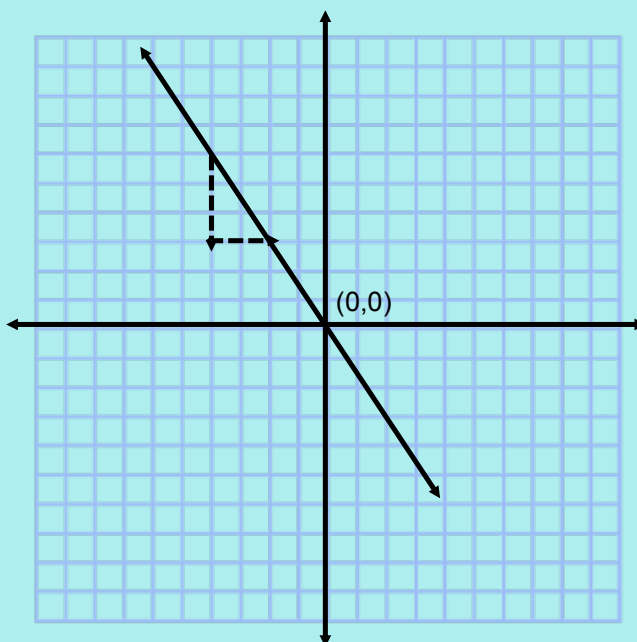
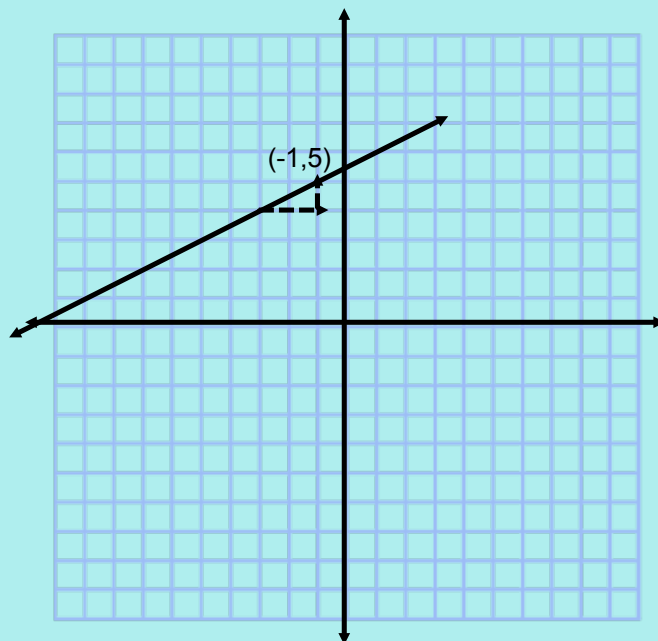
$$(4, 5), m = -1$$

$$(-3, 0), m = 2$$

$$(2, 6), m = 0$$

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. $(\overset{x_1}{-3}, \overset{y_1}{6}), m = -2$

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

$$y - 6 = -2(x - (-3))$$

$$y - 6 = -2(x + 3)$$

$$y - 6 = -2x - 6$$

$$+ 6 \qquad + 6$$
$$y = -2x + 0$$

or $y = -2x$

Lesson 5.3 Given Two Points

What You Need to Know:

To write an equation, you need slope and y-intercept?

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

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

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

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

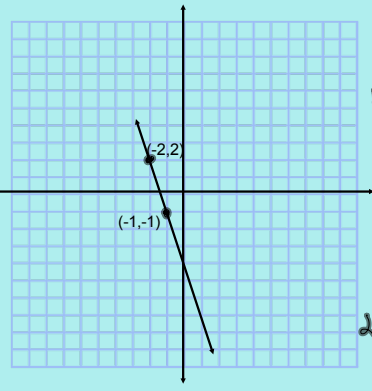
Given Two Points

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

x_1, y_1 x_2, y_2
 $(4, 9), (1, 6)$
 1) $m = \frac{6-9}{1-4}$
 $m = \frac{-3}{-3}$
 $m = 1$
 2) $m = \frac{y_2 - y_1}{x_2 - x_1}$
 $m = \frac{6-9}{1-4}$
 $m = \frac{-3}{-3}$
 $m = 1$
 $y - y_1 = m(x - x_1)$
 $y - 9 = 1(x - 4)$
 $y - 9 = 1x - 4$
 $+9$ $+9$
 $y = x + 5$

x_1, y_1 x_2, y_2
 $(0, 7), (1, -1)$
 1) $m = \frac{-1+7}{1-0}$
 $m = \frac{-8}{1}$
 $m = -8$
 2) $y - y_1 = m(x - x_1)$
 $y - 7 = -8(x - 0)$
 $y - 7 = -8x + 0$
 $+7$ $+7$
 $y = -8x + 7$

x_1, y_1 x_2, y_2
 $(-2, -3), (0, 3)$
 1) $m = \frac{3+(-3)}{0+(-2)}$
 $m = \frac{6}{-2}$
 $m = -3$
 2) $y - y_1 = m(x - x_1)$
 $y - 3 = 3(x - 0)$
 $y - 3 = 3x + 0$
 $+3$
 $y = 3x + 3$
 $y - (-3) = 3(x - (-2))$
 $y + 3 = 3(x + 2)$
 $y + 3 = 3x + 6$
 -3
 $y = 3x + 3$



x_1, y_1 x_2, y_2
 $(-2, 2), (-1, -1)$
 1) $m = \frac{-1+2}{-1+(-2)}$
 $m = \frac{1}{-3}$
 $m = -\frac{1}{3}$
 2) $y - y_1 = m(x - x_1)$
 $y - 2 = -\frac{1}{3}(x - (-2))$
 $y - 2 = -\frac{1}{3}(x + 2)$
 $y - 2 = -\frac{1}{3}x - \frac{2}{3}$
 $+2$ $+2$
 $y = -\frac{1}{3}x + (-4)$
 or
 $y = -\frac{1}{3}x - 4$

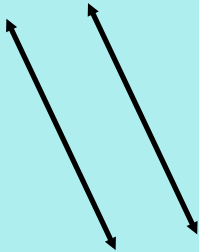
Homework Assignment

Worksheet "Writing Equations Given Two Points"

Parallel and Perpendicular Lines

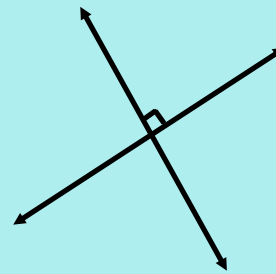
What You Need to Know:

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.

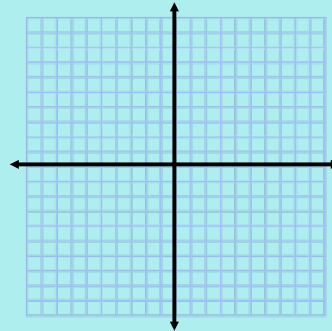
****Point-Slope Formula: $y - y_1 = m(x - x_1)$ when given (x_1, y_1) ****

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

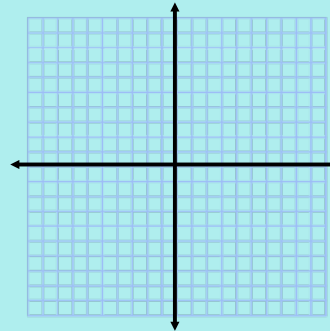
Best-Fit Lines

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

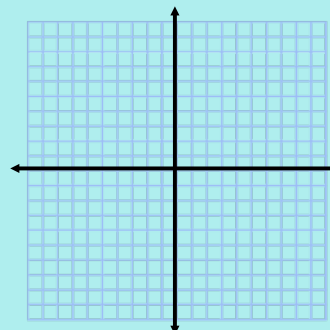
x	y
1	3
2	5
3	8
4	9
5	11
6	12



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"

