Lesson 2.4 Warm Up (Clickers)

1. Find the slope of the line that goes through (5, -1) and (9, -3).

2. Write the equation of a line that has a slope of 1/5 and has a y-intercept of (0, -9).

3. Solve for y: $5x - 2y = 12$

Lesson 2.4 More About Linear Equations

Essential Understanding: The slopes of two lines in the same plane indicate how the lies are related.

> Point-Slope Form: $y - y_1 = m(x - x_1)$
>
> where m is the slope and (x_1, y_1) is the point it goes through.

Ex. Write the equation of the line that goes through (-5, 2) with a slope of 3/5.

Ex. Write the equation of the line that goes through the point (5, -7) with a slope of 2.

1 Write the equation of the line that goes through (7, -1) with slope -3.

Ex. A line passes through (3, 2) and (5, 8) What is an equation of the line in point-slope form?

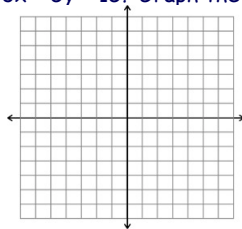2 A line passes through (-5, 0) and (0,7). What is an equation of the line in point-slope form?

Ex. What is an equation of the line y = 2/5x - 3 in standard form? Use integer coefficients.

Standard Form for a line: Ax + By = C where A, B, and C are real numbers and A and B are not both zero.

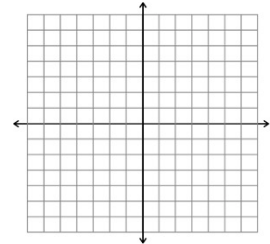Ex. What is an equation of the line y = 3/4x - 5 in standard form? Use integer coefficients.

Concept Summary   Writing Equations of Lines

Slope-Intercept Form	Point-Slope Form	Standard Form
$y = mx + b$	$y - y_1 = m(x - x_1)$	$Ax + By = C$
Use this form when you know the slope and the y-intercept.	Use this form when you know the slope and a point, or when you know two points.	$A, B,$ and C are real numbers. A and B cannot both be zero.

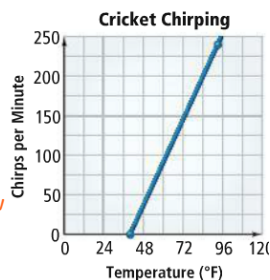Ex. What are the intercepts of 3x + 5y = 15? Graph the equation.

Ex. Graph 2x - 4y = 8.

Ex. The number of times a cricket chirps per minute depends on the temperature. The number of chirps in 2 seconds for two temperatures are shown at the bottom right.

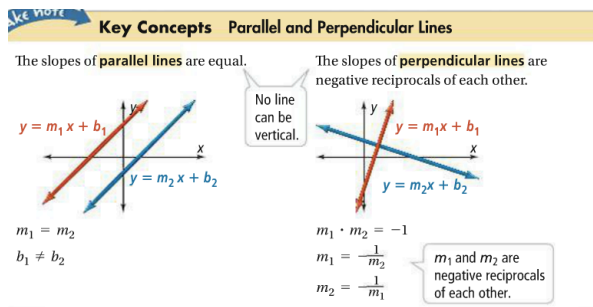a. Write an equation in slope-intercept form for this graph.

b. If the temperature is 70°, how many times would a cricket be expected to chirp in one minute?

Cricket Chirping

Chirps per Minute

250
200
150
100
50
0

0   24   48   72   96   120

Temperature (°F)

Lesson 2.4 Day 2 Warm Up (Clickers)

1. Write the equation of the line that has a slope of 9 and y-intercept (0, -8).

2. Write the equation of the line that goes through the points (5, 7) and (-2, 9).

Lesson 2.4 Day 2

Key Concepts   Parallel and Perpendicular Lines

The slopes of **parallel lines** are equal.

$y = m_1 x + b_1$

$y = m_2 x + b_2$

$m_1 = m_2$
$b_1 \neq b_2$

The slopes of **perpendicular lines** are negative reciprocals of each other.

No line can be vertical.

$y = m_1 x + b_1$

$y = m_2 x + b_2$

$m_1 \cdot m_2 = -1$

$m_1 = -\dfrac{1}{m_2}$

$m_2 = -\dfrac{1}{m_1}$

m_1 and m_2 are negative reciprocals of each other.

Ex. What is the equation of the line parallel to

y = 6x - 2 through (1, -3)?

Ex. Write the equation of the line that is perpendicular to y = -4x + 2/3 through (8, 5).

Ex. What is the equation in slope-intercept form of the perpendicular line to 5x + 3y = 30 that goes through (-7, 12)?

Ex. What is the equation in slope-intercept form of the parallel line to 2x - 4y = 10 that goes through (8, -9)?

3 What is the equation of the line in slope-intercept form of a line parallel to 4x + 2y = 7 through (4, -2)?

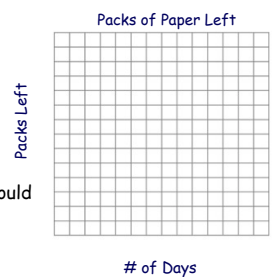4 What is the equation in slope-intercept form of the perpendicular line to y = 2/3x - 1 through (0, 6)?

Ex. The office manager of a small office ordered 140 packs of printer paper. Based on average daily use, she knows that the paper will last about 80 days.

a. What graph represents this situation?

b. What is the equation of the line?

c. How many packs of printer paper should the manager expect to have after 30 days?

Packs of Paper Left

Packs Left

# of Days

Ex. Write an equation of a line in slope-intercept form of a line through (2, 3) with a slope of 1/2.

Ex. Write the equation in slope-intercept form with integer coefficients: 1/5x - 2y = 4.

Ex. Graph the equation of 8x - 4y = 16.