**College Algebra 1**

Section 5.6 – Parallel and Perpendicular Lines

Objective(s): To determine whether lines are parallel, perpendicular or neither.

To write equations of parallel and perpendicular lines.

Starter:

1. Find the x- and y-intercepts of the given equation
2. Graph each equation

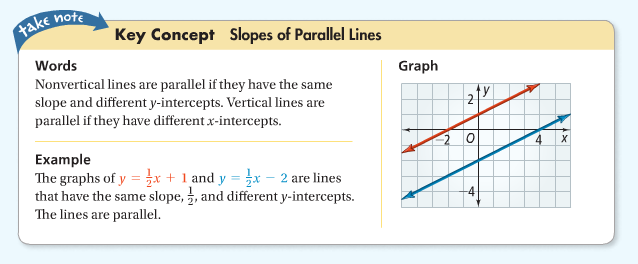
1. Write each equation in standard form.

Notes: **Parallel Lines**

Graph the following lines on the given Coordinate axis.



What do you notice about the graphs of these lines?



* You can use the fact that the slopes of parallel line are the same to write the equation of a line that is parallel to a given line.

Problem 1: Writing an equation of a Parallel Line

1. A line passes through the point (12, 5) and is parallel to the graph of . What equation represents the line in slope-intercept form?

Step 1: Identify the slope of the given line.

Step 2: Write an equation of the line passing through (12, 5) with the slope from step 1.

Graph both lines to check your solution.



1. Write an equation of a line that passes through (-3, -1) and is parallel to the graph of . Write the equation in slope-intercept form.

Step 1: Identify the slope of the given line.

Step 2: Write an equation of the line passing through (-3, -1) with the slope from step 1.

Graph both lines to check your solution.



Try these problems…

Write an equation in slope-intercept form of the line that passes through the given point and is parallel to the graph of the given equation.

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Notes: **Perpendicular Lines**

Graph the pair of lines on the coordinate axis. Please label each line.

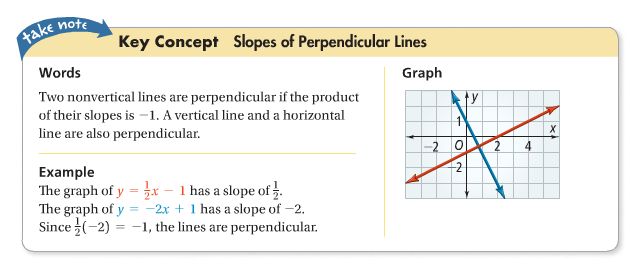


A: C:

B: D:

What do you notice about the graphs of A and B?

What do you notice about the graphs of C and D?



* You can use slope to determine whether two lines are perpendicular. **Perpendicular lines** are lines that intersect to form right angles
* **Perpendicular lines have slopes that are opposite reciprocals of each other**
  + Ex:
  + Ex:

Problem 2: Writing an Equation of a Perpendicular Line

1. Write the equation of the line that passes through the point (2, 4) and is perpendicular to the graph of .

Step 1: Identify the slope of the given equation

Step 2: Find the opposite reciprocal of the slope from step 1.

Step 3: Use the slope from step 2 and the point to write the equation of the line.

1. Write the equation of the line that passes through the point (1, 8) and is perpendicular to the graph of .

Step 1: Identify the slope of the given equation

Step 2: Find the opposite reciprocal of the slope from step 1.

Step 3: Use the slope from step 2 and the point to write the equation of the line.

You try…

Write an equation is slope-intercept form of the line that passes through the given point and is perpendicular to the graph of the given equation.

HW: 5.6 p. 334 #7-27 odd, 28-30