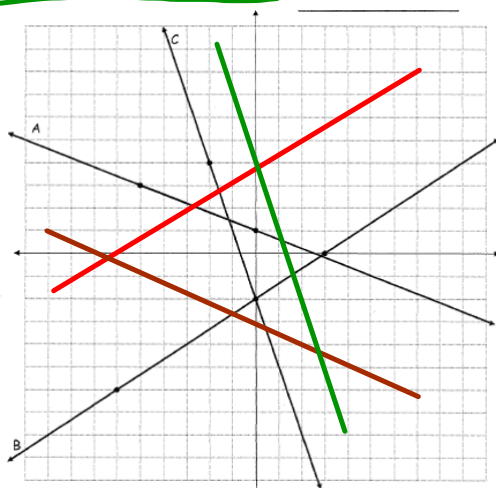# Unit 3 Day 5: Parallel & Perpendicular Lines

Directions: Graph the points and use a ruler to draw the line that passes through them. Use the designated color to draw each line.

RED: (-3, 2)   (0, 4)

BROWN: (-5, -1)   (5, -5)

GREEN: (1, 1)   (2, -2)

Given Lines and Their Points		
A:	(0, 1)	(-5, 3)
B:	(3, 0)	(-6, -6)
C:	(-2, 4)	(0, -2)

The equation of Line A is $y = -\frac{2}{5}x + 1$.

The equation of Line B is $y = \frac{2}{3}x - 2$.

The equation of line C is $y = -3x - 2$.

Directions: Use the points given to write the equation of each line in slope-intercept form.

RED LINE	BROWN LINE	GREEN LINE

$y = \frac{2}{3}x + 4$ $y = -\frac{2}{5}x - 3$

RED LINE:

$+3 \left(\begin{array}{c|c} x & y \\ \hline -3 & 2 \\ 0 & 4 \end{array}\right) +2$

$m = \frac{2}{3}$

$y = \frac{2}{3}x + b$

$2 = \frac{2}{3}(-3) + b$

$2 = \frac{6}{3} + b$

$2 = -2 + b$

$+2 \quad +2$

$4 = b$

BROWN LINE:

$\begin{array}{c|c} x & y \end{array}$

$+10 \left(\dfrac{-5 \mid -1}{5 \mid 2}\right) -4$

$m = \frac{-4}{10} = -\frac{2}{5}$

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

$-1 = -\frac{2}{5}(-5) + b$

$-1 = 2 + b$

$-2 \quad -2$

$b = -3$

GREEN LINE:

$y = -3x + b$

$1 = -3(1) + b$

$1 = -3 + b$

$+3 \quad +3$

$4 = b$

$y = -3x + 4$

Directions: Use your graph to help answer the following questions.

1. Which colored line is parallel to line A?   **BROWN**

   What are the equations of these 2 lines?

   A: $y = -\frac{2}{5}x + 1$ BROWN: $y = -\frac{2}{5}x - 3$

2. Which colored line is parallel to line B?   **RED**

   What are the equations of these 2 lines?

   B: $y = \frac{2}{3}x - 2$ RED: $y = \frac{2}{3}x + 4$

3. Which colored line is parallel to line C?   **GREEN**

   What are the equations of these 2 lines?

   C: $y = -3x - 2$ GREEN: $y = -3x + 4$

Directions: Use the equations of each pair of parallel lines to answer the following questions.

4. What do you notice about the slopes in each pair of equations?

When the lines are parallel the slopes are the same.

5. What do you notice about the y-intercepts of in each pair of equations?

The y-intercepts are different

$$y = 3x + 1$$
$$y = -3x + 1$$

6. What general statement can you make about the equations of parallel lines in relation to $y = mx + b$?

parallel lines have the same slope.

5 min.

Directions: Answer the following the questions using the knowledge you gained from your investigation.

1. Are $y = 3x + 7$ and $y = 3x - 8$ parallel to each other?　　**YES** or　NO

2. Are $y = \frac{2}{3}x - 2$ and $y = \frac{3}{2}x + 1$ parallel to each other?　　YES　or　**NO**

3. Name 3 lines that are parallel to $y = 2x - 3$.

$$y = 2x - 4 \quad y = 2x + 1$$
$$y = 2x - 5$$

4. Name 3 lines that are not parallel to $y = 5x - 2$.

$$y = 6x + 5 \quad y = -2x + 5$$
$$y = 13x + 5 \quad \boxed{y = 5x - 2} \text{ Same line}$$