

Perpendicular Lines Investigation

During this activity you will be discovering the rule of writing equations of perpendicular lines!

Directions: Graph the points and use a ruler to draw the line that passes through them. Use a color of your choice for each line. *Tell me what color you used for each line.*

Color:

(0, 2) and (2, -1)

(-3, 6) and (-6, 5)

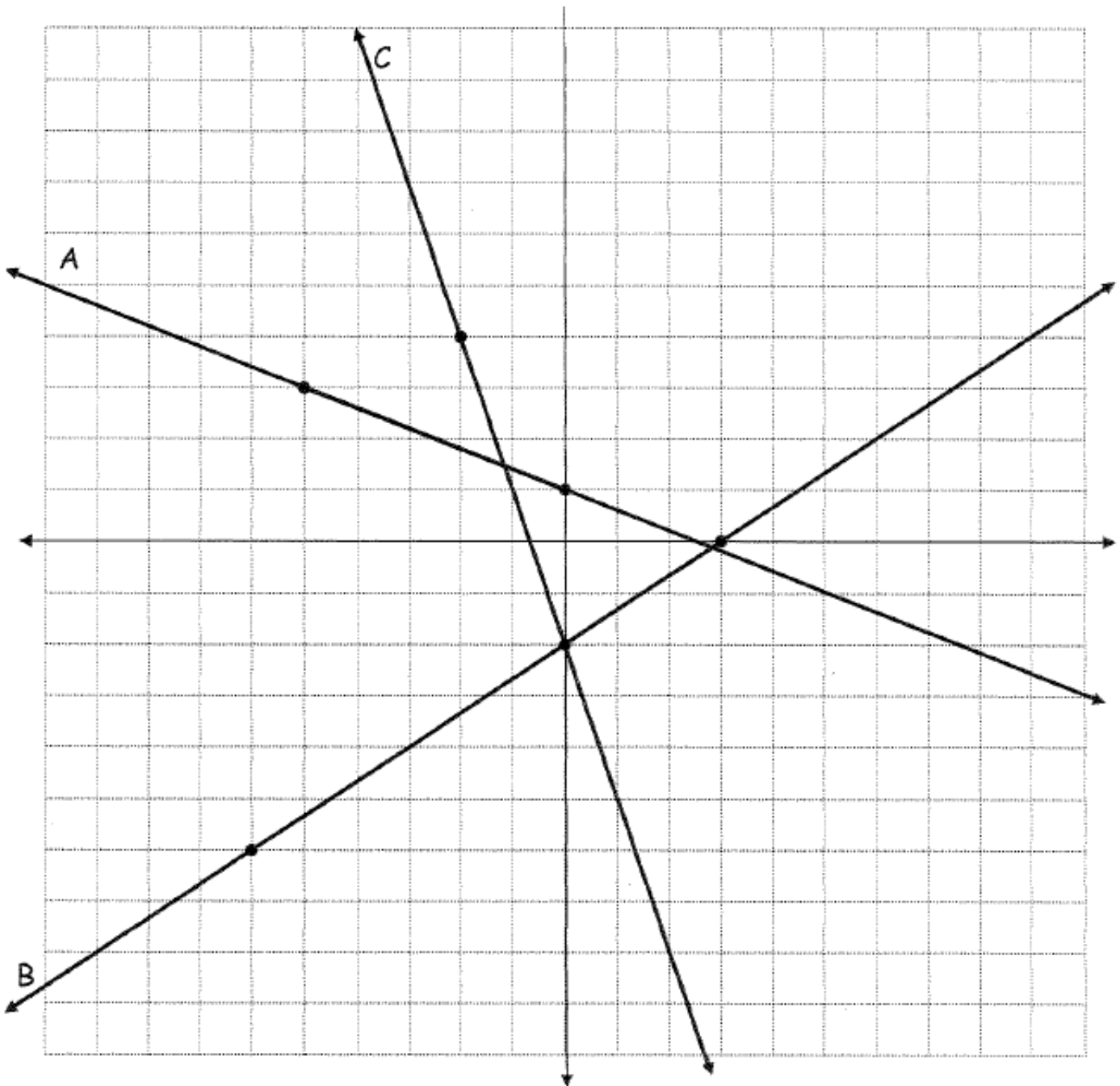
(4, 0) and (6, 5)

Given lines and Their Points

A: (0, 1) and (-5, 3)

B: (3, 0) and (-6, -6)

C: (-2, 4) and (0, -2)



Name: _____ Per: _____

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

The equation for B is $y = \frac{2}{3}x - 2$

The equation for C is $y = -3x - 2$

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

| | | |
|------------------------|------------------------|------------------------|
| <i>Color:</i> _____ | <i>Color:</i> _____ | <i>Color:</i> _____ |
| <i>Equation:</i> _____ | <i>Equation:</i> _____ | <i>Equation:</i> _____ |

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

1. Which colored line is perpendicular to line A? _____

What are the equations of these two lines?

2. Which colored line is perpendicular to line B? _____

What are the equations of these two lines?

3. Which colored line is perpendicular to line C? _____

What are the equations of these two lines?

Directions: Use the equations of each pair of perpendicular lines to answer the following questions. List the pairs of perpendicular lines and their equations.

Line A: _____ Line B: _____ Line C: _____

Color

Color

Color

_____: _____ _____: _____ _____: _____

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

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

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

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

1. Are $y = 3x + 7$ and $y = 3x - 8$ perpendicular to each other? Yes or No

2. Are $y = \frac{2}{3}x - 2$ and $y = -\frac{3}{2}x + 1$ perpendicular to each other? Yes or No

3. Write equations for three lines that are perpendicular to $y = 2x - 3$.

4. Write equations for three lines that are not perpendicular to $y = -5x - 2$.