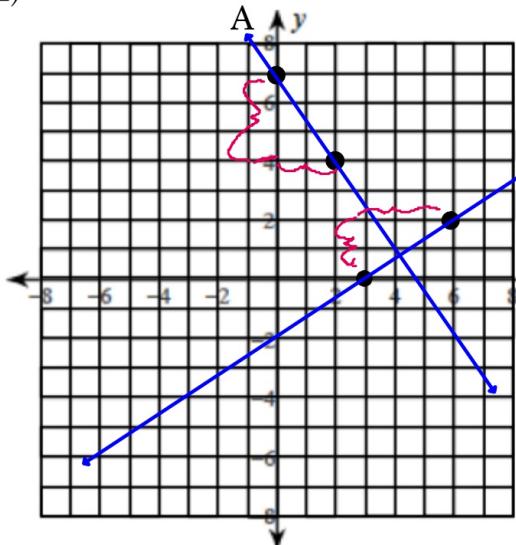


6.1.2: Investigating Perpendicular Lines

Name: _____

1)



- a. What observations can you make about lines A and B?

- look perpendicular (make 90° angles)
- they cross/intersect
- not parallel

- b. Find the slope of:

line A: $\frac{3}{2}$ line B: $\frac{2}{3}$

$\frac{\text{rise}}{\text{run}}$

- c. Using slope-intercept form, write the equation of: $y = mx + b$

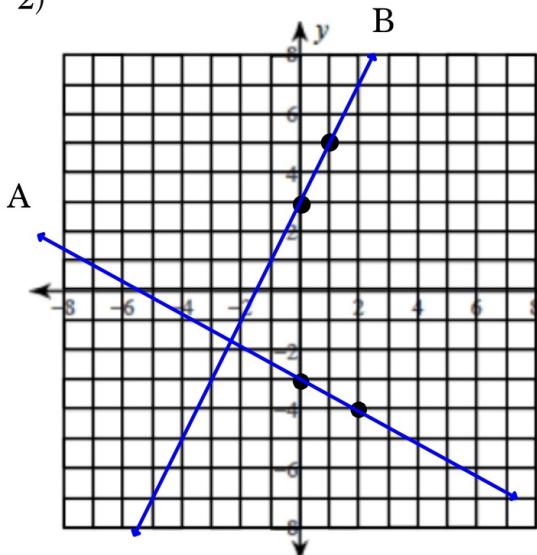
line A: $y = -\frac{3}{2}x + 7$ line B: $y = \frac{2}{3}x - 2$

- d. Compare and contrast the two equations you wrote in part c.

different slopes ; different y-intercepts

slopes → fractions are flipped ; one is positive the other is negative

2)



- a. What observations can you make about lines A and B?

- slopes: 1 positive & 1 negative
- they cross
- look perpendicular ⊥

- b. Find the slope of:

line A: $-\frac{1}{2}$ line B: $\frac{2}{1}$

- c. Using slope-intercept form, write the equation of:

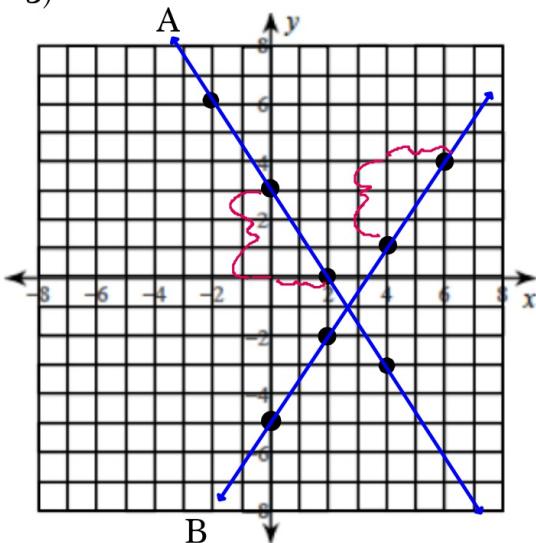
line A: $y = -\frac{1}{2}x - 3$ line B: $y = 2x + 3$

- d. Compare and contrast the two equations you wrote in part c.

slopes - fractions are flipped (reciprocal)

& opposites (1 positive & 1 negative)

3)



a. What observations can you make about lines A and B?

- Intersect
- No 90° angles - not perpendicular
- Not parallel
- Slopes $1 \text{ pos} \approx 1 \text{ neg}$

b. Find the slope of:

line A: $-\frac{3}{2}$ line B: $\frac{3}{2}$

c. Using slope-intercept form, write the equation of:

line A: $y = -\frac{3}{2}x + 3$ line B: $y = \frac{3}{2}x - 5$

d. Compare and contrast the two equations you wrote in part c.

Slopes - 1 positive & 1 negative

4)

The lines in graph 1 & graph 2 are defined as PERPENDICULAR LINES

The lines in graph 3 are NOT PERPENDICULAR.

What information can we conclude about PERPENDICULAR LINES from a:

Graph: make 90° angles

Equation: slopes are opposite reciprocals
 \uparrow \uparrow
 $1 \text{ pos}, 1 \text{ neg}$ flip fraction

5) Are the lines $y = \frac{2}{5}x + 8$ and $y = -\frac{5}{2}x - 6$ perpendicular?
 Explain your answer, using words.

$$m = \frac{2}{5}$$

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

yes \rightarrow slopes
are opposite
reciprocals

6) Are the lines $y = 4x + 3$ and $y = -4x - 10$ perpendicular?

Explain your answer, using words.

$$m = 4 \rightarrow \frac{4}{1} \quad m = -4$$

NO - they are
just opposites

7) Are the lines $2x + 3y = 12$ and $y = \frac{3}{2}x + 10$ perpendicular?
 Explain, using words.

Perpendicular. $\frac{3y = -2x + 12}{3}$
 slopes are opposite reciprocals. $y = -\frac{2}{3}x + 4 \rightarrow m = -\frac{2}{3}$

8.) Are the lines $4x + 2y = 20$ and $y = -2x - 4$ perpendicular?
 Explain, using words.

Not perpendicular. $\frac{2y = -4x + 20}{2}$
 slopes are the same \rightarrow parallel. $y = -2x + 10$
 $m = -2$

9.) Are the lines $-6x + y = 3$ and $y - 9 = -\frac{1}{6}(x + 3)$ perpendicular?
 Explain, using words.

Perpendicular. $\frac{y = 6x + 3}{m = 6}$
 slopes are opposite reciprocals $m = 6 \rightarrow 6/1$

10) Are the lines $-10x + 5y = 20$ and $-8x - 16y = 16$ perpendicular?

Explain, using words.

Perpendicular. $\frac{5y = 10x + 20}{5} \quad \frac{-16y = 8x + 16}{-16}$
 slopes are opposite reciprocals. $y = 2x + 4 \quad m = 2 \rightarrow 2$ $y = -\frac{1}{2}x - 1 \quad m = -\frac{1}{2}$