Name: _____   Date: _____   Period: _____

1.7: Proving Lines are Parallel, Perpendicular, or Intersecting

🌶️ MILD: START HERE

1. State the **slope** of the line that is **parallel** to the lines below:

a) $y = -\frac{2}{3}x + 7$

slope:

b) $y = 5x + 1$

slope:

c) $y = \frac{9}{7}x + 1$

slope:

2. State the **slope** of the line that is **perpendicular** to the lines below:

a) $y = \frac{4}{5}x + 7$

slope:
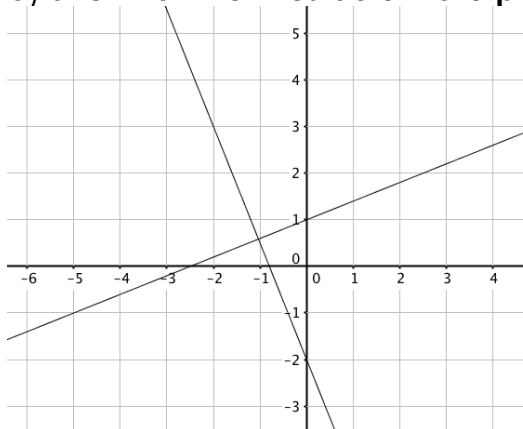
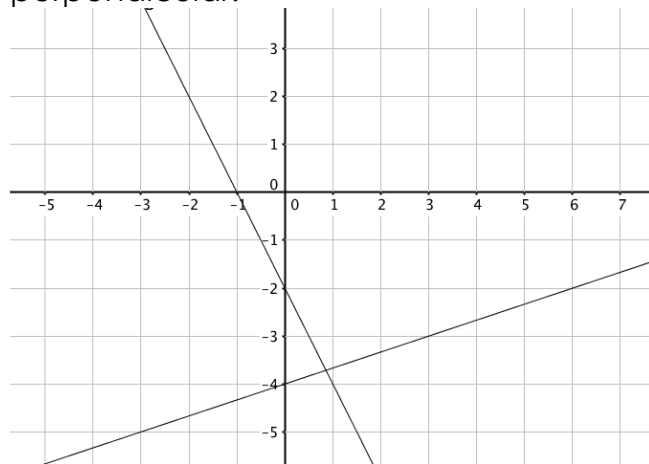b) $y = -\frac{9}{8}x + 1$

slope:

c) $y = x + 1$

slope:

🌶️ MEDIUM: START HERE

a) Show tat the lines below are **perpendicular:**

b) Show that the lines below are **not** perpendicular:

3. Decide if the following pairs of lines are parallel, perpendicular, or neither.   Provide justification for your answer!

a)
$y = -3x + 7$
$y = \frac{1}{3}x - 4$

b)
$2x + y = 10$
$3y + 6x = 12$

c)
$-2x + 5y = 20$
$2x + 5y = 15$

They are _____ because:

They are _____ because:

They are _____ because:

4. The line a goes through the points $(6, -4)$ and $(-5, 0)$. The line b passes through the points $(2, -7)$ and $(-9, -3)$. Are the lines parallel? Why or why not?
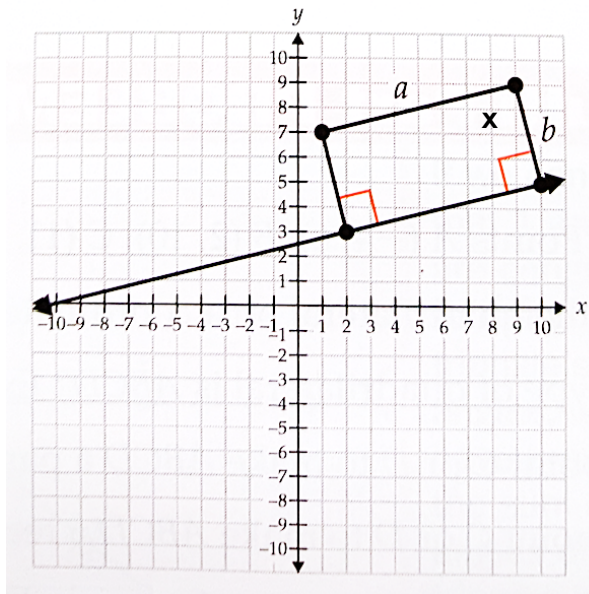
In questions 5 through 8 below, find the equation of the line that fits the criteria.

5. A line passes through the point (-1,5) and is parallel to the line $y = -2x + 6$

6. A line passes through the point (3, 4) and is perpendicular to the line $y = \frac{3}{4}x + 6$

7.

a) Find the slope of segment a:

b) Find the slope of segment b:

c) What does this tell you about the angle x? Explain your answer:

8. Two vertices of a triangle are (0, 5) and (0, -5). Define the third vertex in such a way that the resulting triangle has a right angle. (Note that there are many possible correct answers.)
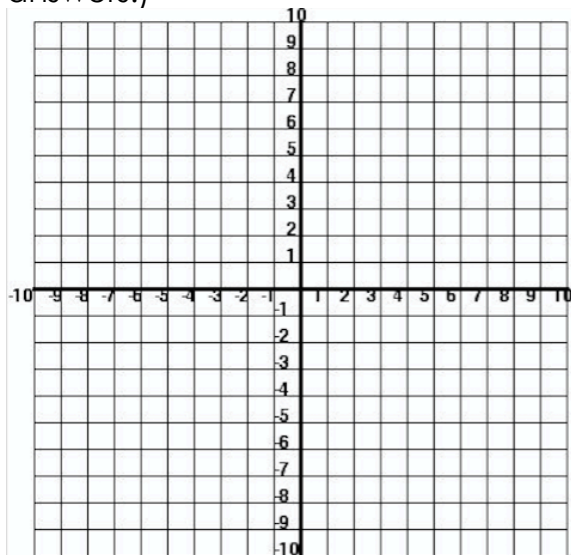
9. Find an equation of the line passing through the point (6,5) and perpendicular to the line whose equation $2y + 3x = 6$

10. SUPER SPICY!

The equations of lines k, m, and n are given below.
$$k: 3y + 6 = 2x$$
$$m: 3y + 2x + 6 = 0$$
$$n: 2y = 3x + 6$$

Which statement is true?
1) $k \parallel m$
2) $n \parallel m$
3) $m \perp k$
4) $m \perp n$