Lesson 16 – Parallel and Perpendicular Lines

Goal: • Can determine the slope of a line in any form. • Can build an equation to a line given information about the slope being parallel or perpendicular to another line.
New Terminology: • Parallel • Perpendicular

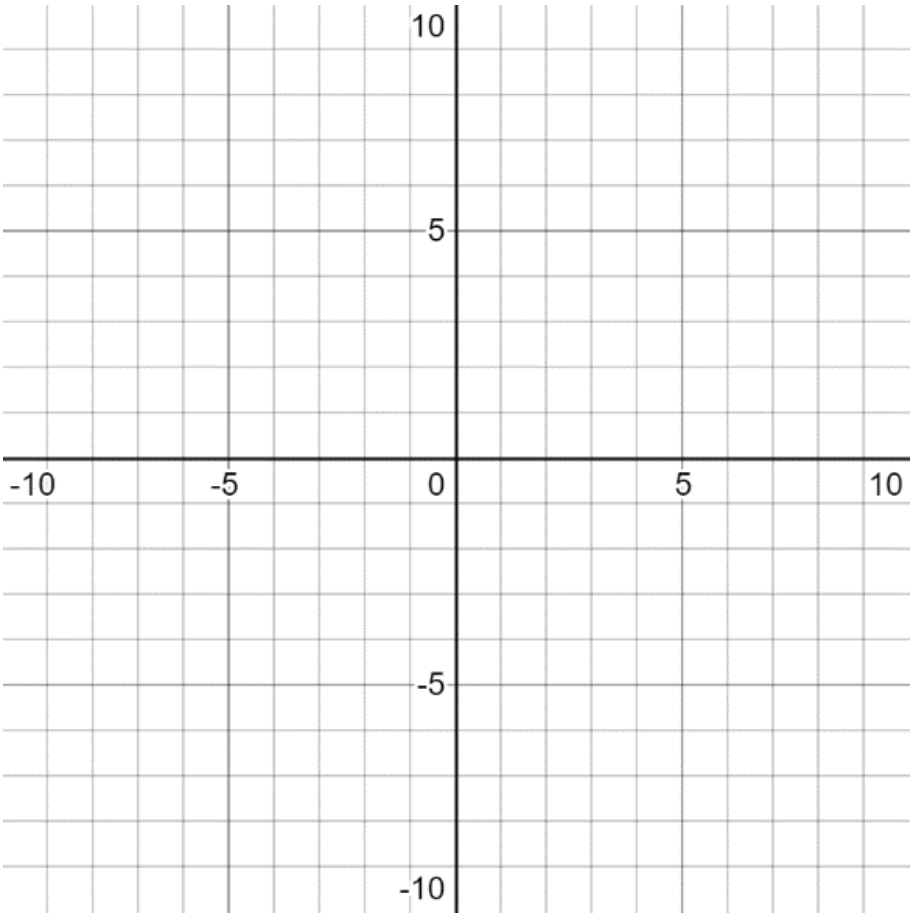
Review: Determine the slopes of the following lines and sketch them below. Label each line.

$$y = \frac{1}{5}x + 7$$

$$y + 3 = -\frac{7}{6}(x - 6)$$

$$3x - 15y - 30 = 0$$

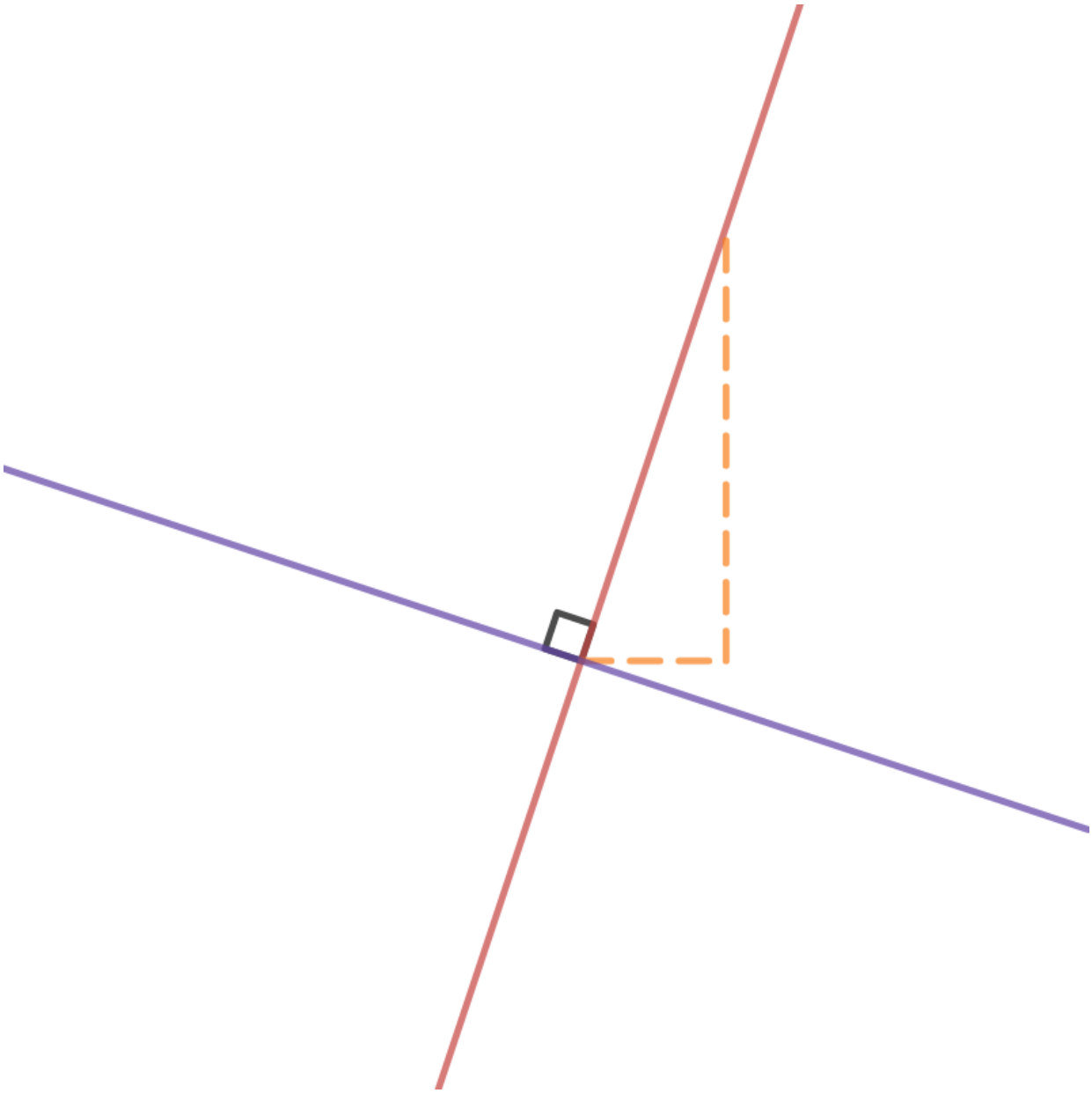
$$5x + y = -10$$



Two lines are **PARALLEL** if they have the same slope

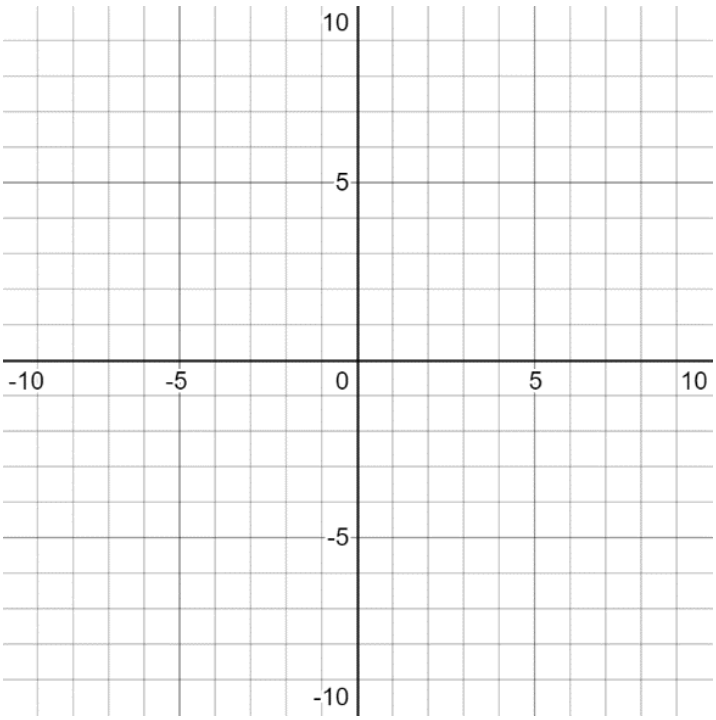
Two lines are **PERPENDICULAR** if they intersect at 90° (a right angle)

Discuss: Consider the two lines that are **PERPENDICULAR.** Determine the slopes of the lines relative to each other.

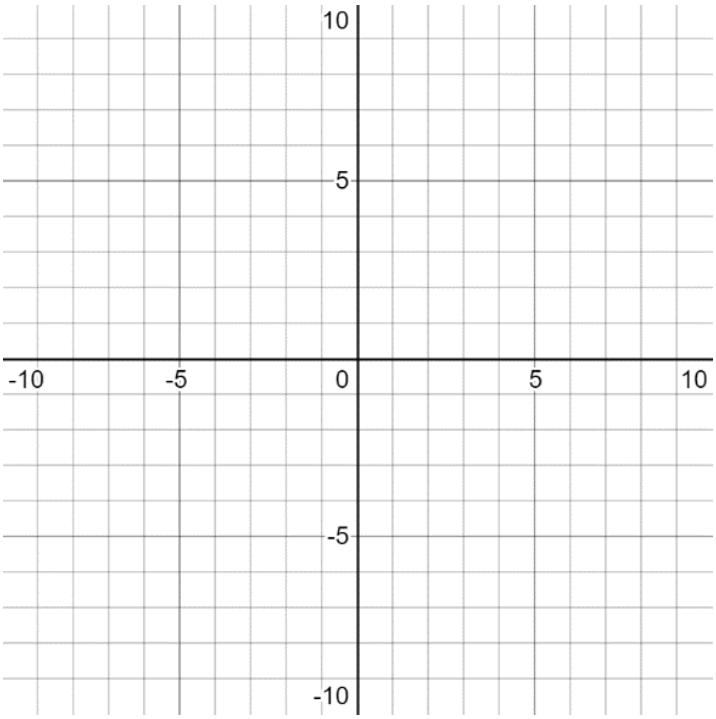


Rather than giving you the slope directly, you can be given the slope relative to another line saying that it is parallel or perpendicular and then you can infer the slope based on that information.

Example: Determine the equation of the line that passes through the point $(-5, -2)$ and is perpendicular to the line $7x + 6y + 12 = 0$



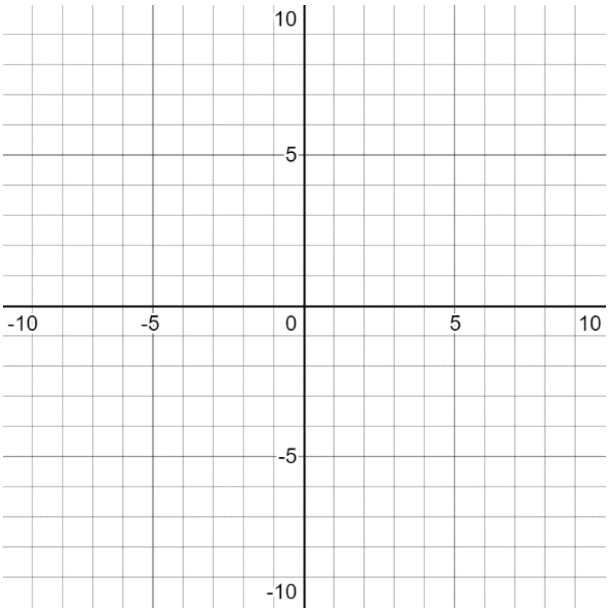
Practice: Determine the equation to the line that passes through the point $(3, -2)$ and is parallel to the line that passes through the points $(5, 7)$ and $(8, -2)$



We can also use the definition of the slope more intimately to determine missing points.

Example: Determine the value of x such that the line that passes through $(x, 2)$ and $(1, -2)$ is parallel to the line

$$5x - 3y + 9 = 0$$

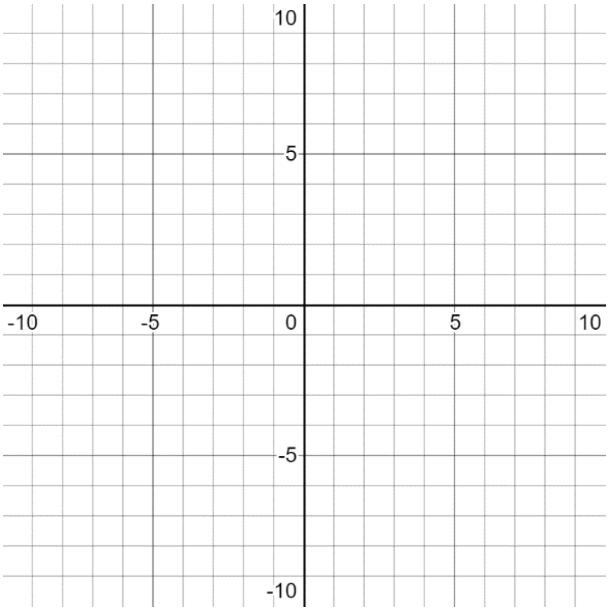


Practice: Determine the value of n such that the line

$$nx + 4y = 8$$

Is perpendicular to the line

$$2x - 9y = 27$$



Assigned Problems: 7.4 page 390 – 395 # 1-7, 10, 11, 13, 15, 16, 17, 19, 20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