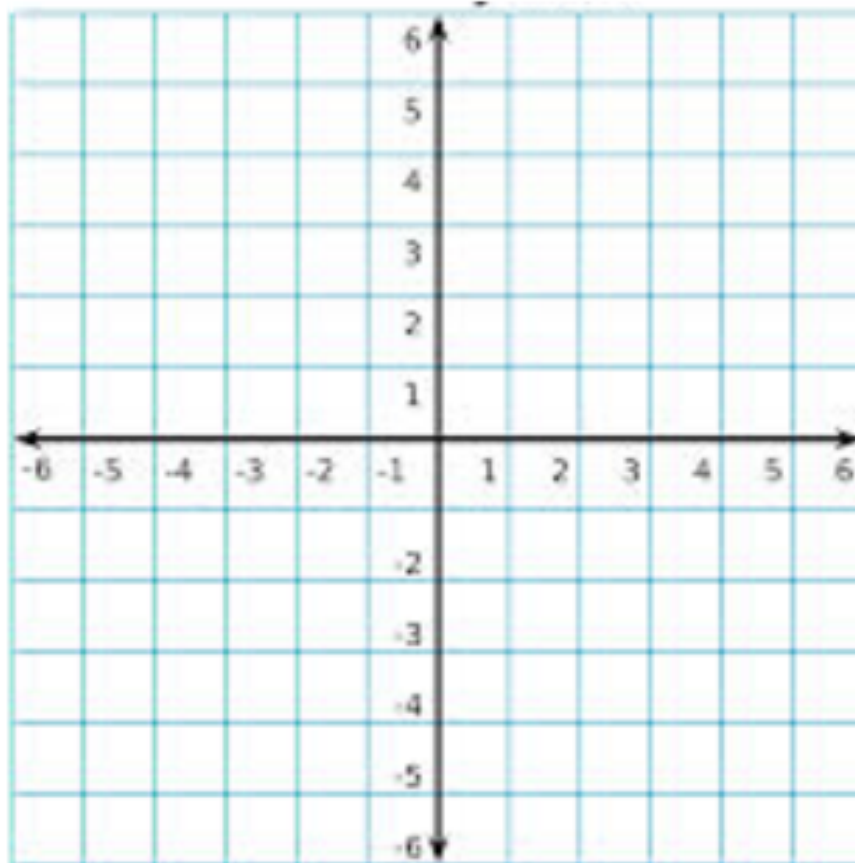


Example

- a) Draw 2 different line segments with slope $\frac{7}{5}$.
- b) How are the line segments in part a the same?
How are they different?



6.2 Slopes of Parallel and Perpendicular Lines

Lesson Focus

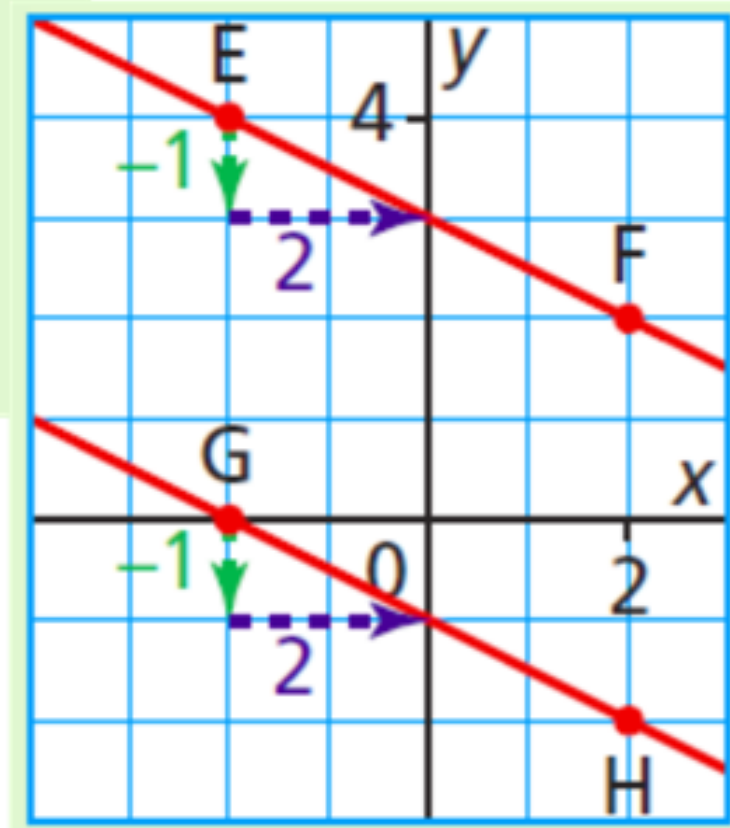
Use slope to determine whether two lines are parallel or perpendicular

Slopes of Parallel Lines

Two lines are parallel when they have equal slopes.

$$\text{Slope of } EF = -\frac{1}{2}$$

$$\text{Slope of } GH = -\frac{1}{2}$$



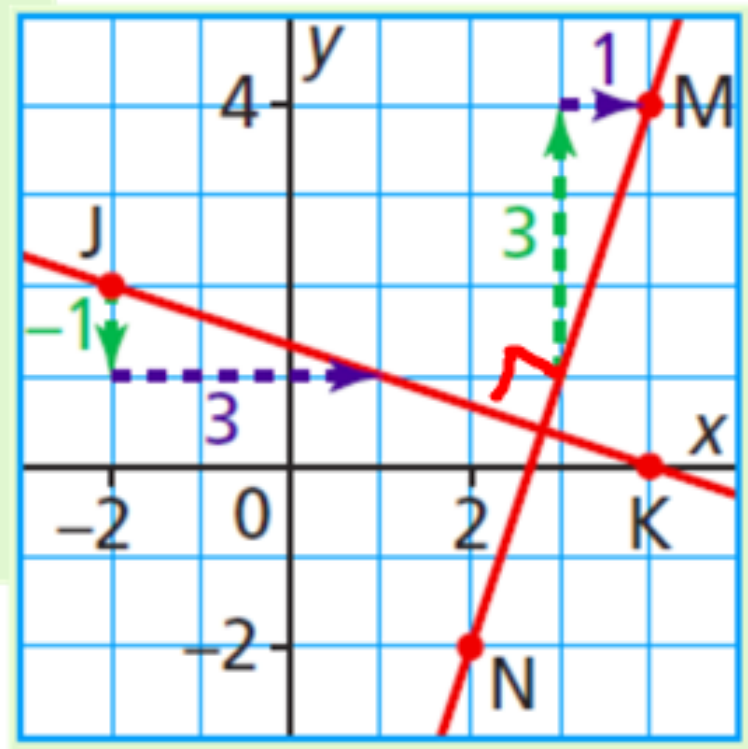
Perpendicular Slopes of Parallel Lines

Two lines are perpendicular when their slopes are negative reciprocals.

$$\text{Slope of } MN = 3$$

$$\text{Slope of } JK = -\frac{1}{3}$$

$$(3)\left(-\frac{1}{3}\right) = -1$$



Example

Line PQ passes through P(x_1, y_1) and Q(x_2, y_2).

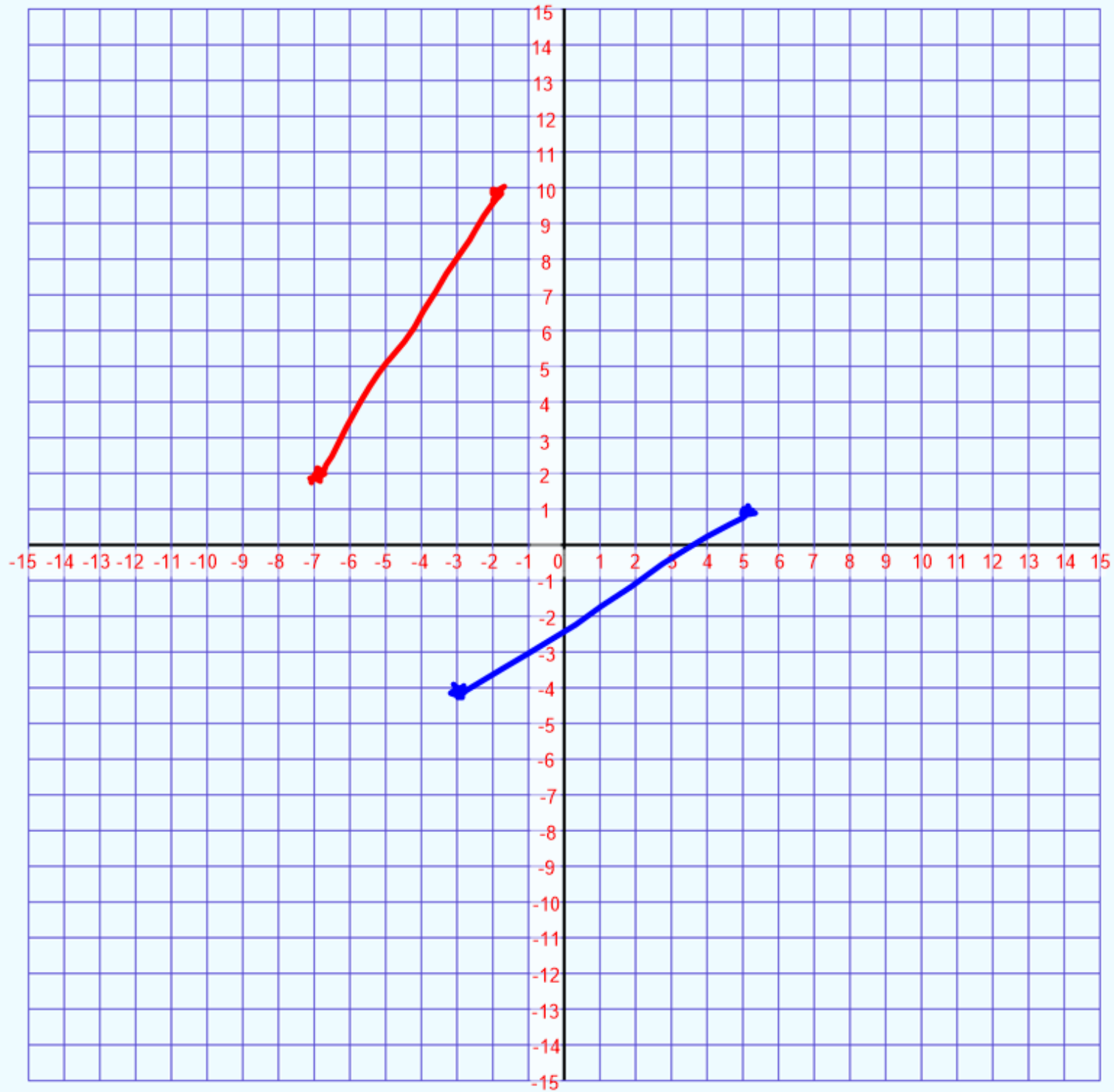
Line RS passes through R(x_1, y_1) and S(x_2, y_2).

a) Are these two lines parallel, perpendicular, or **neither**?
Justify the answer.

b) Sketch the lines to verify the answer to part a.

$$m_{PQ} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{10 - 2}{-2 - (-7)} = \frac{8}{5}$$

$$m_{RS} = \frac{1 - (-4)}{5 - (-3)} = \frac{5}{8}$$



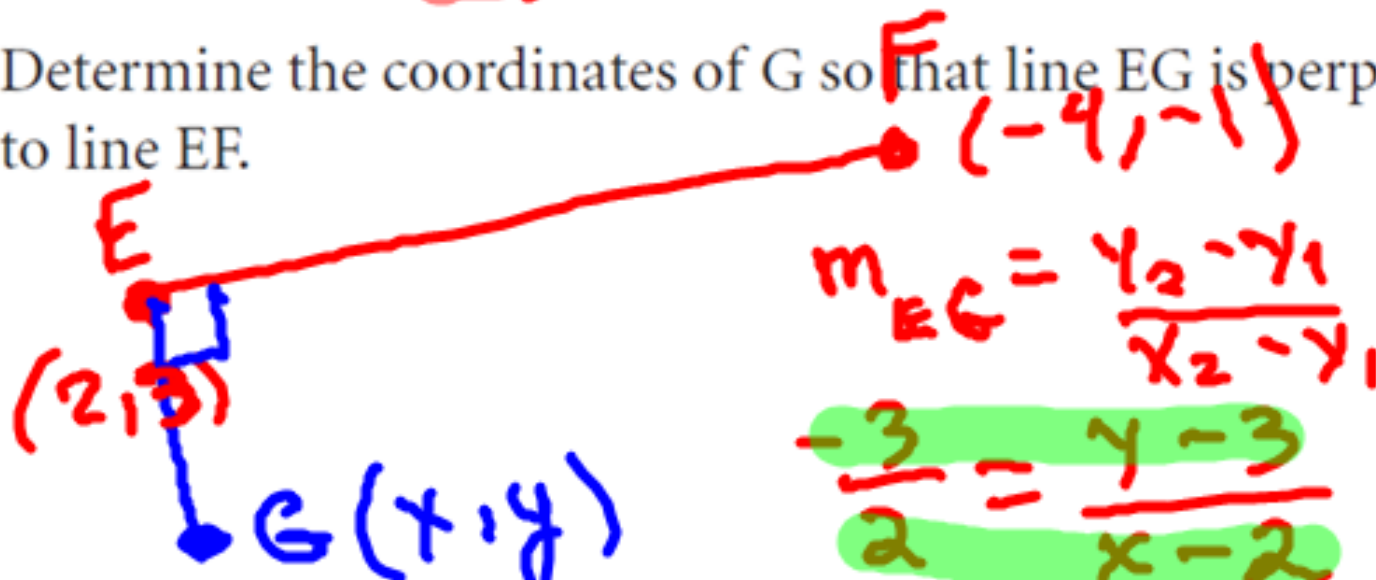
Example

- a) Determine the slope of a line that is perpendicular to the line through E(2, 3) and F(-4, -1).

$$m_{EF} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - 3}{-4 - 2} = \frac{-4}{-6} = \frac{2}{3}$$

$$m_{\perp} = -\frac{3}{2}$$

- b) Determine the coordinates of G so that line EG is perpendicular to line EF.



$$y - 3 = -3$$

$$y = 0$$

$$x - 2 = 2$$

$$x = 4$$

$$G$$
$$(4, 0)$$

Homework

- **6.2 P. 348-351**
3, 4, 5, 8, 10, 15, 17