Exercise 22

For the following exercises, use the descriptions of each pair of lines given below to find the slopes of Line 1 and Line 2. Is each pair of lines parallel, perpendicular, or neither?

- Line 1: Passes through $(0, 5)$ and $(3, 3)$
- Line 2: Passes through $(1, -5)$ and $(3, -2)$

Solution

Use the slope formula for each line.

$$\text{Line 1}: \quad m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - 5}{3 - 0} = \frac{-2}{3} = -\frac{2}{3}$$

$$\text{Line 2}: \quad m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - (-5)}{3 - 1} = \frac{3}{2}$$

Because the slopes are negative reciprocals, the lines are perpendicular.