

Exercise 21

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 (1, 7) and (5, 5)
 - Line 2: Passes through (-1, -3) and (1, 1)
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Solution

Use the slope formula for each line.

$$\text{Line 1 : } m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - 7}{5 - 1} = \frac{-2}{4} = -\frac{1}{2}$$

$$\text{Line 2 : } m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - (-3)}{1 - (-1)} = \frac{4}{2} = 2$$

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