

# Find and Use Slopes of Lines

## Activity

For Exercises 1–4, determine whether each pair of lines through the points given below is parallel, perpendicular, or neither.

**A(1, 2)    B(3, 4)    C(5, 2)    D(8, 3)    E(3, 8)    F(-6, 5)**

1.  $\overline{AB}$  and  $\overline{BC}$

2.  $\overline{AB}$  and  $\overline{CD}$

3.  $\overline{AB}$  and  $\overline{DE}$

4.  $\overline{CD}$  and  $\overline{EF}$

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5. Given A(0, -3), B(5, 3), and Q(-3, -1), find two possible locations for a point P such that  $\overline{PQ}$  is parallel to  $\overline{AB}$ . Explain your reasoning.

6. Given C(-2, -1), D(5, -4), and Q(4, 2), find two possible locations for a point P such that  $\overline{PQ}$  is perpendicular to  $\overline{CD}$ . Explain your reasoning.

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For Exercises 7–4, determine whether the statement is true (T) or false (F)

7. \_\_\_\_ If two nonvertical lines are parallel, then they have the same slope.
8. \_\_\_\_ The lines  $y = 3x + 7$  and  $y = 7x + 3$  are parallel.
9. \_\_\_\_ If two lines have the same slope, then the lines are nonvertical parallel lines.
10. \_\_\_\_ If two lines are perpendicular and neither one is vertical, then one of the lines has a positive slope, and the other has a negative slope.
11. \_\_\_\_ If two lines are perpendicular and neither one is vertical, then the slopes of the two lines are opposites.
12. \_\_\_\_ If two nonvertical lines are perpendicular, then their slopes are opposite reciprocals of one another, or the product of their slopes is  $-1$ .
13. \_\_\_\_ If the product of the slopes of two lines is  $-1$ , then the lines are nonvertical perpendicular lines.
14. \_\_\_\_ The lines  $y = 3x + 7$  and  $y = -7x + 3$  are perpendicular
15. \_\_\_\_ Horizontal and vertical lines are always perpendicular: therefore, two lines, one of which has a zero slope and the other an undefined slope are perpendicular.

16. Given points Q, R, S, and T, tell which sides, if any, of quadrilateral QRST in the given figure are parallel or perpendicular. Prove your answer is correct.

