Slope and Perpendicular Lines

Practice and Problem Solving: A/B

Line A contains the points (–1, 5) and (1, –3). Line B contains the points (2, 3) and (–2, 2).

1. Are the lines A & B perpendicular? Explain your reasoning.

Figure *WXYZ* has as its vertices the points *W*(2, 7), *X*(5, 6), *Y*(5, –4), and *Z*(–1, –2).

Find each slope.

2. $\overline{WX}$ 3. $\overline{XY}$ 4. $\overline{YZ}$ 5. $\overline{ZW}$
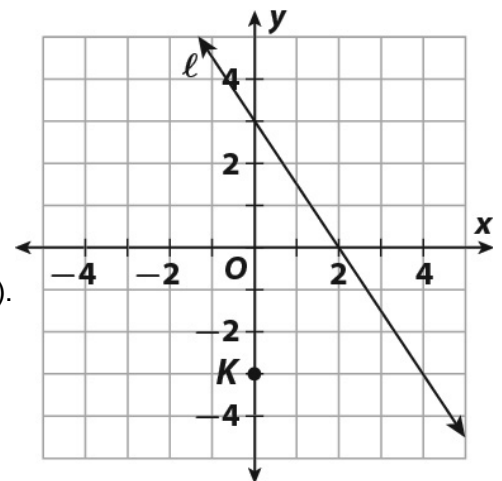
6. Is Figure *WXYZ* a rectangle? Explain your reasoning.

For Problems 7–10, use the graph at the right.

7. Find the slope of line ℓ.
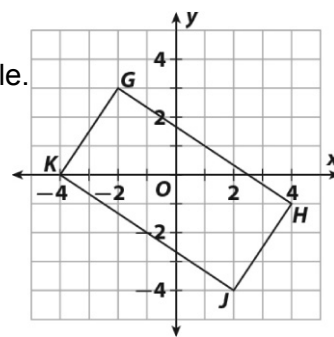

8. Line *t* is perpendicular to line ℓ and passes through point *K*(0,-3).
   Find the slope of line *t*.

9. Find the equation of line *t*.

For Problems 10–15, use the graph.

10. Describe a method you can use to show that Figure *GHJK* is a rectangle.

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Find each slope.

11. $\overline{GH}$ 12. $\overline{HJ}$ 13. $\overline{JK}$ 14. $\overline{KG}$

15. Is Figure *GHJK* a rectangle? Explain your reasoning.

In Exercises 16 – 19, determine which of the lines, if any, are parallel or perpendicular. Explain.

16 Line *a* passes through (−2, 1) and (0, 3).

   Line *b* passes through (4, 1) and (6, 4).

   Line *c* passes through (1, 3) and (4, 1).

18. Line a: $4x - 3y = 2$

   Line b: $y = \dfrac{4}{3}x + 2$

   Line c: $4y + 3x = 4$

In Exercises 20 - 23, write an equation of the line that passes through the given point and is

perpendicular to the given line.

20. $(7,10); y = \dfrac{1}{2}x - 9$

21. $(-4,-1); y = \dfrac{4}{3}x + 6$

22. $(-3,3); 2y = 8x - 6$

23. $(8,1); 2y + 4x = 12$

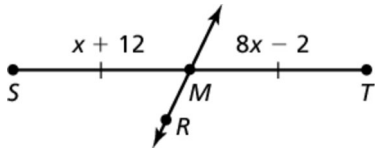25. The vertices of a quadrilateral are $A(2, 2)$, $B(6, 4)$, $C(8, 10)$, and $D(4, 8)$.

a. Is quadrilateral $ABCD$ a parallelogram? Explain.
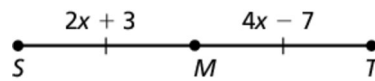
b. Is quadrilateral $ABCD$ a rectangle? Explain.

Review:

In Exercises 30 and 31, identify the segment bisector of $\overline{ST}$. Then find *ST*.

30.

31.

In Exercises 32 and 33, the endpoints of $\overline{JK}$ are given. Find the coordinates of the midpoint *M*.

32. $J(-3, 2)$ and $K(9, 2)$

33. $J(1, 3)$ and $K(7, 5)$

In Exercises 34 and 35, find the measure of each angle.

34. $\angle ABC$ and $\angle CBD$ are supplementary angles, $m\angle ABC = 7x°$ and $m\angle CBD = 8x°$.

35. $\angle WXY$ and $\angle YXZ$ are complementary angles, $m\angle WXY = (2x + 5)°$, and $m\angle YXZ = (8x - 5)°$.