Name_____ Date _____

3.5 Practice A

In Exercises 1 and 2, find the coordinates of point *P* along the directed line segment *ST* so that *SP* to *PT* is the given ratio.

1. $S(6, 4)$, $T(-4, -8)$; 1 to 3

2. $S(-6, 7)$, $T(9, 25)$; 2 to 3

In Exercises 3 and 4, tell whether the lines through the given points are *parallel*, *perpendicular*, or *neither*. Justify your answer.

3. Line 1: $(2, 3)$, $(4, 12)$
Line 2: $(5, 10)$, $(14, 8)$

4. Line 1: $(-6, -10)$, $(4, -2)$
Line 2: $(-8, -6)$, $(0, 4)$

In Exercises 5 and 6, write an equation of the line passing through point *P* that is parallel to the given line.

5. $P(-1, 3)$, $y = 4x - 7$

6. $P(2, -3)$, $y = -6x + 10$

In Exercises 7 and 8, write an equation of the line passing through point *P* that is perpendicular to the given line.

7. $P(6, 10)$, $y = -3x + 13$

8. $P(0, -8)$, $y = -\frac{1}{3}x - 10$

In Exercises 9 and 10, find the distance from point *Q* to the given line.

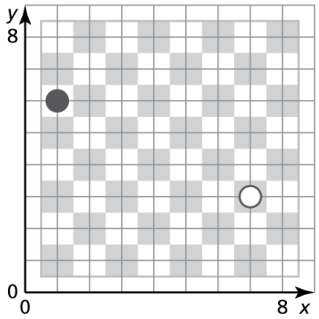
9. $Q(2, 6)$, $y = -x + 4$

10. $Q(-10, -4)$, $5x - y = 6$

11. A line through $(3, 5)$ and $(k, 12)$ is perpendicular to a line through $(0, 7)$ and $(2, 10)$. Find the value of k that makes the above statement true.

12. Your friend claims that if a line has a slope that is less than 1, then any line perpendicular to it must have a positive slope. Is your friend correct? Explain your reasoning.

13. You and your friend are playing a game of checkers. There are only two pieces left on the board. Find the coordinates of point *P* along the line segment connecting the black and white checkers so that the ratio of the distance between the black checker and *P* to *P* and the white checker is 2 to 1.



Name _____ Date _____

3.5 Practice B

In Exercises 1 and 2, find the coordinates of point *Q* along the directed line segment *LM* so that *LQ* to *QM* is the given ratio.

1. $L(-1, -2)$, $M(3, 6)$; 5 to 3

2. $L(2, 7)$, $M(-1, 1)$; 2 to 1

3. Tell whether the lines through the given points are *parallel*, *perpendicular*, or *neither*. Justify your answer.

Line 1: $(2.5, -2)$, $(9.5, 12)$ Line 2: $(-4, -2)$, $(8, -4)$

4. Write an equation of the line passing through point $P(-1, -4)$ that is parallel to $y = -6x + 8$.

5. Write an equation of the line passing through point $P(-1, 3)$ that is perpendicular to $y = 4x - 7$.

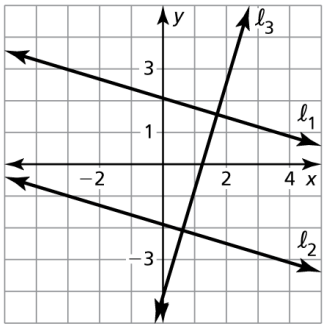
In Exercises 6 and 7, find the distance from point *P* to the given line.

6. $P(4, 8)$, $6 = y + 2x$

7. $P(-2, 1)$, $y = \frac{1}{4}x - 3$

8. A line through $(-1, b)$ and $(c, 8)$ is parallel to a line through $(-6, 3)$ and $(0, 12)$. Find values of b and c that make the above statement true.

9. The graph shows three lines. The slope of line l_1 is m_1, where $-1 \leq m_1 < 0$.



a. Lines l_1 and l_2 are parallel. What do you know about the slope of line l_2?

b. Lines l_1 and l_3 are perpendicular. What do you know about the slope of line l_3?

c. What is the relationship between l_2 and l_3? Justify your answer.

10. Two lines are perpendicular. Is it possible for the lines to have the same y-intercept? Justify your answer.

11. The diagram shows a map of a playground. The water fountain lies directly between the swings and the slide. The distance from the swings to the water fountain is one-third the distance from the water fountain to the slide. What point on the graph represents the water fountain?