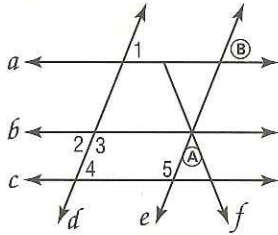


# 3 Chapter 3 Open-Ended Assessment

Demonstrate your knowledge by giving a clear, concise solution to each problem. Be sure to include all relevant drawings and justify your answers. You may show your solution in more than one way or investigate beyond the requirements of the problem.

- 1. TOWN PLANNING** The lines in the diagram represent the intersection of streets near Todd's home.  $\textcircled{A}$  represents the location of Todd's home, and  $\textcircled{B}$  represents the location of a library. 1, 2, 3, 4, and 5 represent the angles formed at street intersections.



- Suppose you want to determine whether the streets represented by lines  $a$ ,  $b$ , and  $c$  are parallel. What information would you need? Explain your reasoning.
  - Suppose the streets represented by lines  $d$  and  $e$  are parallel. If the measure of  $\angle 5$  is 112, find the measure of  $\angle 4$ . Explain how you determined the measure.
  - If  $m\angle 1 = 3x - 7$  and  $m\angle 4 = 2x + 20$ , find  $x$  so that lines  $a$  and  $c$  are parallel. Explain how you arrived at your answer and describe why these measures allow you to determine that  $a$  and  $c$  are parallel.
  - Todd wants to go from the library to his home. If the streets represented by lines  $a$  and  $b$  are parallel, how could Todd determine the shortest distance between  $\textcircled{B}$  and street  $b$  on which he lives? Give an explanation and illustrate your answer on a sketch of the above diagram.
- 2.** Draw a line  $\ell$  on a coordinate grid so that the line contains  $(-3, -1)$  and  $(2, 4)$ .
- Write an equation of the line in slope-intercept form. Provide an explanation for each of the steps.
  - If you construct a line parallel to  $\ell$ , what is the slope of the line? How do you know? Construct a line parallel to  $\ell$  that contains  $(1, 5)$ .
  - Find the distance between the two lines. Explain how you determined the distance.