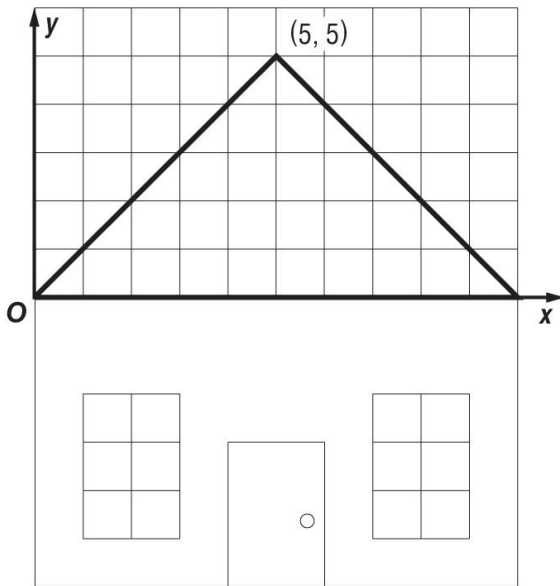# 4-3 Word Problem Practice
## *Parallel and Perpendicular Lines*

**1. BUSINESS** Brady's Books is a retail store. The store's average daily profits $y$ are given by the equation $y = 2x + 3$ where $x$ is the number of hours available for customer purchases. Brady's adds an online shopping option. Write an equation in slope-intercept form to show a new profit line with the same profit rate containing the point (0, 12).

**2. ARCHITECTURE** The front view of a house is drawn on graph paper. The left side of the roof of the house is represented by the equation $y = x$. The rooflines intersect at a right angle and the peak of the roof is represented by the point (5, 5). Write the equation in slope-intercept form for the line that creates the right side of the roof.



**3. ARCHAEOLOGY** An archaeologist is comparing the location of a jeweled box she just found to the location of a brick wall. The wall can be represented by the equation $y = -\frac{5}{3}x + 13$. The box is located at the point (10, 9). Write an equation representing a line that is perpendicular to the wall and that passes through the location of the box.

**4. GEOMETRY** A parallelogram is created by the intersections of the lines $x = 2$, $x = 6$, $y = \frac{1}{2}x + 2$, and another line. Find the equation of the fourth line needed to complete the parallelogram. The line should pass through (2, 0). (*Hint:* Sketch a graph to help you see the lines.)

**5. INTERIOR DESIGN** Pamela is planning to install an island in her kitchen. She draws the shape she likes by connecting the vertices of the square tiles on her kitchen floor. She records the location of each corner in the table.

| Corner | Distance from West Wall (tiles) | Distance from South Wall (tiles) |
|--------|--------------------------------|----------------------------------|
| A | 5 | 4 |
| B | 3 | 8 |
| C | 7 | 10 |
| D | 11 | 7 |

**a.** How many pairs of parallel sides are there in the shape *ABCD* she designed? Explain.

**b.** How many pairs of perpendicular sides are there in the shape she designed? Explain.

**c.** What is the shape of her new island?