

**Challenge: Skills and Applications**

For use with pages 285–291

**In Exercises 1–3, write an equation in slope-intercept form of the line.**

1. through  $(2\frac{1}{4}, -5)$  and  $(-1\frac{1}{2}, 3\frac{1}{3})$
2. through  $(-\frac{1}{6}, \frac{2}{3})$  and perpendicular to  $4x - 2y = 9$
3. through  $(k, -2)$  and perpendicular to  $8 - 3x = 9y$

**In Exercises 4–7, use the following information.**

Rectangle  $ABCD$  has vertices at  $A(4, 7)$ ,  $B(3, 1)$ , and  $C(-3, 2)$ .

4. Find the equation of the line that contains  $\overline{AB}$ .
5. Find the equation of the line that contains  $\overline{BC}$ .
6. Find the equation of the line that contains  $\overline{CD}$ .
7. Find the equation of the line that contains  $\overline{AD}$ .

**In Exercises 8–11, use the following information.**

Suppose that a certain strain of pea plant requires 14 days to reach a height of 6 inches and 30 days to reach a height of 16 inches.

8. Write a linear equation that models the height of the plant after  $x$  days.
9. About how many days would it take a plant of this strain to reach a height of 12 inches?
10. What should the height of the plant be after 20 days?
11. According to the model, what should the height of the plant be after zero days? Why do you think this value is negative?