

**Challenge: Skills and Applications**

For use with pages 597–602

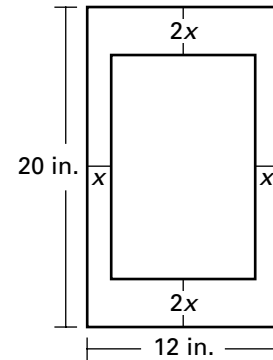
**In Exercises 1–6, solutions are given. Find a polynomial equation that has only these solutions.**

- |                                |                                            |
|--------------------------------|--------------------------------------------|
| 1. 0, 3, $-2$                  | 2. 0 (repeated factor), $-4$               |
| 3. $-\frac{1}{2}$ , 5, 7       | 4. $\frac{2}{3}$ , 4, $-\frac{5}{6}$       |
| 5. $-k$ , $\frac{k}{5}$ , $4k$ | 6. $2k$ , $\frac{4k}{7}$ , $-\frac{5}{9k}$ |

**In Exercises 7–8, use the following information.**

A poster is 12 inches wide and 20 inches high. The border of the poster is twice as wide on the top and bottom as it is on the sides. The printed part of the poster has an area of 126 square inches.

- Write an algebraic model for this situation.
- Find the width of the side borders and the width of the top and bottom borders.



**In Exercises 9–12, use the following information.**

An on-line computer service company charges a monthly fee of \$12 and has 6000 customers. A market survey has shown that for every \$1 increase in the monthly fee the company would lose 200 customers.

- Suppose the monthly fee is increased by  $n$  dollars above its present figure. Write expressions for the new monthly fee, the new number of customers the company would have, and the total monthly revenue that the company would take in (number of customers  $\times$  monthly fee).
- Graph the revenue function from Exercise 9.
- For what monthly fee would the company have no customers at all?
- What monthly fee should the company charge in order to maximize its monthly revenue?