EXAMPLE 10 The local thespian society sold tickets to its opening night performance for \$5 and drew an audience of 100 people. The next night it reduced the price by \$0.25, and 10 more people attended; that is, 110 people bought tickets at \$4.75 apiece. In fact, for each \$0.25 reduction in price, 10 additional tickets were sold. Write an expression for the society's revenue from ticket sales on any particular night.

Solution Let x stand for the *number* of \$0.25 reductions in price. Then the price of a ticket can be expressed as

$$5.00 - 0.25x.$$

At this price, the society can expect to sell

$$100 + 10x$$

tickets—10 additional tickets for each \$0.25 price reduction. The total revenue is then given by

$$\begin{aligned} \text{revenue} &= (\text{price per ticket})(\text{number of tickets sold}) \\ &= (5.00 - 0.25x)(100 + 10x), \end{aligned}$$

or $500 + 25x - 2.5x^2$ dollars when the ticket price is reduced by \$0.25x.

EXERCISE 1.3

A

■ *Simplify each product. See Example* 1.

1. $(y^2z)^3$
2. $(yz^4)^2$
3. $(2xy^2z)^2$
4. $(3x^2yz^2)^3$
5. $(-2ab^3c)^3$
6. $(-3a^2bc^3)^3$

■ *See Example* 2.

7. $(7t)(-2t^2)$
8. $(4c^3)(2c)$
9. $(4a^2b)(-10ab^2c)$
10. $(-6r^2s^2)(5rs^3)$
11. $2(3x^2y)(x^3y^4)$
12. $-5(ab^3)(-3a^2bc)$
13. $(-r^3)(-r^2s^4)(-2rt^2)$
14. $(-5mn)(2m^2n)(-n^3)$
15. $(y^2z)(-3x^2z^2)(-y^4z)$
16. $(-3xy)(2xz^4)(3x^3y^2z)$
17. $(2rt)(-3r^2t)(-t^2)$
18. $-a^2(ab^2)(2a)(-3b^2)$