EXAMPLE 7 **Divide a rational expression by a polynomial**

Divide: $\dfrac{6x^2 + x - 15}{4x^2} \div (3x^2 + 5x)$

$$\dfrac{6x^2 + x - 15}{4x^2} \div (3x^2 + 5x) = \dfrac{6x^2 + x - 15}{4x^2} \cdot \dfrac{1}{3x^2 + 5x}$$ **Multiply by reciprocal.**

$$= \dfrac{(3x + 5)(2x - 3)}{4x^2} \cdot \dfrac{1}{x(3x + 5)}$$ **Factor.**

$$= \dfrac{(3x + 5)(2x - 3)}{4x^2(x)(3x + 5)}$$ **Divide out common factors.**

$$= \dfrac{2x - 3}{4x^3}$$ **Simplified form**

✓ **GUIDED PRACTICE** for Examples 6 and 7

Divide the expressions. Simplify the result.

11. $\dfrac{4x}{5x - 20} \div \dfrac{x^2 - 2x}{x^2 - 6x + 8}$

12. $\dfrac{2x^2 + 3x - 5}{6x} \div (2x^2 + 5x)$

8.4 EXERCISES

HOMEWORK KEY

○ = **WORKED-OUT SOLUTIONS**
on p. WS1 for Exs. 7, 25, and 49

= **TAKS PRACTICE AND REASONING**
Exs. 20, 23, 50, 52, 54, and 55

SKILL PRACTICE

1. **VOCABULARY** Copy and complete: To divide one rational expression by another, multiply the first rational expression by the __?__ of the second rational expression.

2. **WRITING** How do you know when a rational expression is simplified?

EXAMPLE 1
on p. 573
for Exs. 3–20

REASONING Match the rational expression with its simplified form.

3. $\dfrac{x^2 - 9x + 14}{x^2 - 5x - 14}$

4. $\dfrac{x^2 - 4}{x^2 + 9x + 14}$

5. $\dfrac{x^2 + 5x - 14}{x^2 - 4x + 4}$

A. $\dfrac{x - 2}{x + 7}$

B. $\dfrac{x - 2}{x + 2}$

C. $\dfrac{x + 7}{x - 2}$

SIMPLIFYING Simplify the rational expression, if possible.

6. $\dfrac{4x^2}{20x^2 - 12x}$

7. $\dfrac{x^2 - x - 20}{x^2 + 2x - 15}$

8. $\dfrac{x^2 + 2x - 24}{x^2 + 7x + 6}$

9. $\dfrac{x^2 - 11x + 24}{x^2 - 3x - 40}$

10. $\dfrac{x^2 + 4x + 4}{x^2 - 5x + 4}$

11. $\dfrac{2x^2 + 2x - 4}{x^2 - 5x - 14}$

12. $\dfrac{x - 4}{x^3 - 64}$

13. $\dfrac{x^2 - 36}{x^2 + 12x + 36}$

14. $\dfrac{3x^3 + 6x^2 + 12x}{x^3 - 8}$

15. $\dfrac{8x^2 + 10x - 3}{6x^2 + 13x + 6}$

16. $\dfrac{5x^2 + 18x - 8}{10x^2 - x - 2}$

17. $\dfrac{x^3 - 5x^2 - 3x + 15}{x^2 - 8x + 15}$