12.5 EXERCISES

HOMEWORK KEY

- = **WORKED-OUT SOLUTIONS** on p. WS1 for Exs. 5, 15, and 35
- = **TAKS PRACTICE AND REASONING** Exs. 21, 26, 27, 28, 36, 37, 39, and 40
- = **MULTIPLE REPRESENTATIONS** Ex. 35

SKILL PRACTICE

1. **VOCABULARY** Copy and complete: To divide by a rational expression, multiply by its ___?___.

2. **WRITING** *Describe* how to multiply a rational expression by a polynomial.

EXAMPLES 1, 2, and 3 on pp. 802–803 for Exs. 3–10, 12

MULTIPLYING EXPRESSIONS **Find the product.**

3. $\frac{9p^2}{7} \cdot \frac{5}{6p^4}$

4. $\frac{5}{8q^6} \cdot \frac{4q^5}{3}$

5. $\frac{v^2 + v - 12}{5v + 10} \cdot \frac{-v - 2}{v^2 + 5v + 4}$

6. $\frac{y - 2}{-2y^2 - 10y} \cdot \frac{4y^2 + 20y}{y^2 - 4}$

7. $\frac{5x}{2x^3 - 17x^2 - 9x} \cdot \frac{4x^2 - 20x - 144}{20}$

8. $\frac{r^5}{7r^3 + 56r} \cdot (r^2 + 8)$

9. $\frac{-3m}{m^2 - 7m + 10} \cdot (m - 5)$

10. $\frac{2n - 6}{3n^2 - 7n - 6} \cdot (3n^2 + 14n + 8)$

EXAMPLES 4 and 5 on p. 804 for Exs. 11, 13–21

ERROR ANALYSIS ***Describe*** **and correct the error in finding the product or quotient.**

11. $\frac{x^3}{5} \div \frac{15x^3}{2}$

$$\frac{x^3}{5} \div \frac{15x^3}{2} = \frac{5}{x^3} \cdot \frac{15x^3}{2}$$
$$= \frac{75x^3}{2x^3}$$
$$= \frac{75}{2}$$

12. $\frac{x - 2}{x + 5} \cdot \frac{x}{2 - x}$

$$\frac{x - 2}{x + 5} \cdot \frac{x}{2 - x} = \frac{(x - 2)x}{(x + 5)(2 - x)}$$
$$= \frac{(x - 2)x}{(x + 5)(2 - x)}$$
$$= \frac{x}{x + 5}$$

DIVIDING EXPRESSIONS **Find the quotient.**

13. $\frac{16r^2}{3} \div \frac{12}{5r}$

14. $\frac{25s^{12}}{18} \div \frac{5s^6}{2}$

15. $\frac{2w^2 + 5w}{w^2 - 81} \div \frac{w^2}{w + 9}$

16. $\frac{c^2 + c}{c^2 + c - 30} \div \frac{c - 6}{c^2 - 11c + 30}$

17. $\frac{a^2 + 3a - 10}{a^2 + 6a - 7} \div \frac{9a^3 - 18a^2}{3a^2 + 18a - 21}$

18. $\frac{2x^2 - 9x + 9}{35x + 14} \div \frac{-3x^2 + 13x - 12}{15x^2 - 14x - 8}$

19. $\frac{4k^2 + 4k - 15}{2k - 3} \div (2k + 5)$

20. $\frac{t^2 - 9t - 22}{5t - 1} \div (5t^2 + 9t - 2)$

21. **TAKS REASONING** What common factor do you divide out when finding the quotient $\frac{x^2 - 3x + 2}{x^2 - 2x - 3} \div \frac{x^2 + 4x + 3}{x^2 - 7x + 12}$?

(A) $x - 1$ (B) $x - 3$ (C) $x + 1$ (D) $x + 3$