

1.8 Practice Set

1. What is a rational expression?
2. Give all equivalent forms of the rational expression $-\frac{a}{b}$.
3. Give all equivalent forms of the rational expression $\frac{x}{1-x}$.
4. How is factoring important when multiplying rational expressions?
5. Does $\frac{x}{x+3}$ simplify to $\frac{1}{3}$? Why or why not?

Simplify each of the following rational expressions.

6.
$$\frac{3x-9x^2}{3x}$$

7.
$$\frac{4y-12}{7y-21}$$

8.
$$\frac{y-2}{2-y}$$

9.
$$\frac{x^2-16}{4-x}$$

10.
$$\frac{4x^2+4x-3}{2x^2+9x-5}$$

11.
$$\frac{8x^2-14x-4}{12x^3+3x^2+4x+1}$$

12.
$$\frac{x^2-2x+4}{x^3+8}$$

Perform the indicated operation and simplify completely.

$$13. \quad \frac{9x-12}{21} \cdot \frac{7}{4-3x}$$

$$14. \quad \frac{14x-28}{4x+8} \cdot \frac{x^2-4}{x^2-4x+4}$$

$$15. \quad \frac{x^2-6x-7}{3x^2-147} \cdot \frac{x^2+14x+49}{5x^2+40x+35}$$

$$16. \quad \frac{2x}{9} \div \frac{4x-12}{9x-27}$$

$$17. \quad \frac{x^2-16x+64}{2x^2-12x-16} \div \frac{x^2-64}{2x}$$

$$18. \quad \frac{x^2-2x-15}{5x^2-125} \div \frac{x^2+8x+15}{x^2+10x+25}$$

$$19. \quad \frac{3x-x^2}{2x^3-54} \div \frac{2x}{x^2+3x+9}$$

$$20. \quad \frac{6b+12}{4b+16} \div \frac{ab-4b+2a-8}{a^2-8a+16}$$

$$21. \quad \frac{3x^2-3x-18}{5x^2+5x+10} \div \frac{x^2+5x+6}{x^2+7x+12}$$

$$22. \quad \frac{r^3-s^3}{r-s}$$

$$23. \quad \frac{6}{x} \cdot \frac{4xy}{x^3} \cdot \frac{12x^2}{x^5}$$

$$24. \quad \frac{7x^2-13x-2}{x^2+x-2} \cdot \frac{x^2+4x-5}{35x^2+12x+1} \div \frac{5x^2-8x-4}{15x^2-2x-1}$$

$$25. \quad \frac{4x^2-36}{3x^2-12x} \div \frac{x^3+3x^2}{5x^2-20x} \cdot \frac{18x^3+15x^2}{5x^2-15x}$$

Distributed Practice Problems

Perform the indicated operation(s) and/or simplify each of the following expressions completely.

$$26. \quad \left(\frac{x^7 y^{-2}}{z^{-9}} \right)^{-3}$$

$$27. \quad (8x^7 y^3)^{-2} (5x^8 y^3)^2$$

$$28. \quad 6^{-1} + 5^{-2}$$

$$29. \quad (2x - 3)^2$$

$$30. \quad x(3x - 1)(x + 1) - (4x - 1)(x - 1)$$