

# Chapter 8 Review Exercises

Fill in each blank with word that correctly completes the sentence.

1. A rational expression is a fractional expression in which the numerator and denominator are \_\_\_\_\_ . (8.1)
2. When simplifying fractions, we may only divide out common \_\_\_\_\_ , never terms. (8.1)
3. One concern about rational expressions is that the denominator can never be \_\_\_\_\_ . (8.1)
4. To divide fractions, invert the second fraction and \_\_\_\_\_ : (8.2)
5. Like fractions are two or more fractions that have the same \_\_\_\_\_ . (8.3)
6. A fraction that has a fraction within the numerator and/or the denominator is called a \_\_\_\_\_ fraction. (8.5)

## Section 8.1

For each fraction, identify the restriction placed on the variable.

7.  $\frac{2x + 5}{x + 4}$

8.  $\frac{x - 3}{6x - 18}$

9.  $\frac{x^2 + 5x}{7 - 14x}$

Simplify each rational expression.

10.  $\frac{5x - 15}{x^2 - 9}$

11.  $\frac{p^2 + 5p}{4p + 20}$

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

13.  $\frac{2r - 6}{3r - r^2}$

14.  $\frac{x^2 - 4x - 45}{x + 5}$

15.  $\frac{y^2 - 1}{y^2 + 5y - 6}$

16.  $\frac{x - 6}{x^2 - x - 30}$

17.  $\frac{6 - 2x}{x^2 + 5x - 24}$

18.  $\frac{3p^2 + 13p + 4}{p^2 + 2p - 8}$

## Section 8.2

Apply the indicated operation. Simplify wherever possible.

19.  $\frac{16w^2}{9x} \cdot \frac{3x^3}{4w}$

20.  $\frac{30p^2}{6m^2} \div \frac{25mp}{4}$

21.  $\frac{4y^2}{3y^2 - 9y} \div \frac{8y}{5y - 15}$

22.  $\frac{x^2 - 16}{3x + 12} \cdot \frac{3x}{x^2 - 4x}$

23.  $\frac{2y - 4}{y^2 - 9} \div \frac{1}{y^2 - 3y}$

24.  $\frac{x^2 + 7x + 10}{x^2 + 2x} \cdot \frac{4x^2 - 20x}{x^2 - 25}$

25.  $\frac{w^2 + w - 12}{w^2 - 9} \div \frac{4w}{4w + 12}$

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

## Section 8.3

Apply the indicated operation. Simplify the result, if possible.

27.  $\frac{5w - 3}{6w - 3} + \frac{3w - 1}{6w - 3}$

28.  $\frac{5m + 4}{m^2 - 36} + \frac{8 - 3m}{m^2 - 36}$

29.  $\frac{y^2 - 2y}{y^2 - 4y - 32} + \frac{y^2 + 10y}{y^2 - 4y - 32}$

30.  $\frac{x^2 + 2x}{x^2 - x - 6} + \frac{x - 18}{x^2 - x - 6}$

31.  $\frac{x^2}{x + 3} + \frac{9}{-(x + 3)}$

32.  $\frac{3y - 7}{y - 2} - \frac{1}{-(y - 2)}$

33.  $\frac{4a + 7}{a^2 - 25} - \frac{a - 8}{a^2 - 25}$

34.  $\frac{y^2 - y}{y^2 - 2y - 3} - \frac{4y + 6}{y^2 - 2y - 3}$

## Section 8.4

For each pair of fractions, find a common target denominator, then build up each fraction to have that denominator.

35.  $\frac{x-3}{x^2+4x}$  and  $\frac{-2}{x}$

36.  $\frac{x+1}{x^2+x-12}$  and  $\frac{1}{x^2-3x}$

Perform the operation. Simplify your result, if possible.

37.  $\frac{5}{12x} + \frac{2x-1}{4x^2}$

38.  $\frac{3}{2ab^2} - \frac{1}{a^2b}$

39.  $\frac{3}{x} + \frac{x-1}{x+2}$

40.  $\frac{1}{x-3} - \frac{x}{x+1}$

41.  $\frac{4x-18}{x^2-9} + \frac{1}{x-3}$

42.  $\frac{x-7}{2x-2} + \frac{2x+1}{x^2-x}$

43.  $\frac{x-5}{x^2-10x+24} - \frac{2}{x^2-4x}$

44.  $\frac{6}{x^2-9} - \frac{4}{x^2+2x-3}$

## Section 8.5

Simplify each simpler complex fraction using any method.

45.  $\frac{\frac{8}{35}}{\frac{16}{15}}$

46.  $\frac{\frac{18xy}{5w^2}}{\frac{27x^2y}{25w^2}}$

Simplify each higher level complex fraction using any method.

47.  $\frac{\frac{1}{4} + \frac{1}{2y}}{\frac{1}{4} - \frac{1}{y^2}}$

48.  $\frac{4 - \frac{8}{x}}{1 - \frac{4}{x^2}}$

49.  $\frac{\frac{1}{2} - \frac{2}{x} + \frac{3}{2x^2}}{1 - \frac{3}{x}}$

50.  $\frac{\frac{1}{6} + \frac{1}{2x} - \frac{3}{x^2}}{\frac{2}{3} - \frac{2}{x}}$