Chapter 8

8.1 **The variables x and y vary inversely. Use the given values to write an equation relating x and y. Then find y when $x = -5$.**

1. $x = 2, y = -10$ **2.** $x = \frac{1}{3}, y = 24$ **3.** $x = -3, y = -5$ **4.** $x = 25, y = -\frac{2}{5}$

8.1 **Determine whether x and y show *direct variation*, *inverse variation*, or *neither*.**

5.

x	y
2.5	32
4	20
5	16
6.4	12.5
8	10

6.

x	y
1	2.5
3.5	8.75
5	12.5
8	20
9	22.5

7.

x	y
11	30
14	61
16	85
24	92
27	105

8.

x	y
1	12
3	4
8	1.5
12	1
15	0.8

8.2 **Graph the function. State the domain and range.**

9. $y = \frac{6}{x}$ **10.** $y = \frac{-2}{x} + 3$ **11.** $y = \frac{5}{x - 1} - 2$ **12.** $y = \frac{4x + 19}{x + 3}$

8.3 **Graph the function.**

13. $y = \frac{x}{x^2 - 4}$ **14.** $y = \frac{x^2 + 1}{x^2 + 4x + 3}$ **15.** $y = \frac{x^2 + 2x - 3}{x + 2}$ **16.** $f(x) = \frac{2x^2 - 8}{x^2 - 2x}$

8.4 **Simplify the rational expression, if possible.**

17. $\frac{x^2 + x - 6}{x^2 + 9x + 18}$ **18.** $\frac{x^3 - 100x}{x^4 + 20x^3 + 100x^2}$ **19.** $\frac{x^2 - 5x - 84}{2x^2 - 98}$ **20.** $\frac{x^2 + 7x + 10}{x^2 - 7x + 10}$

8.4 **Multiply or divide the expressions. Simplify the result.**

21. $\frac{6x^2y}{xy^2} \cdot \frac{2y}{9x^3}$ **22.** $\frac{2x^2 - x - 6}{2x^2 + 5x + 3} \cdot \frac{x^2 + x}{x^2 - 4}$ **23.** $\frac{3x^2 + 15x}{x^2 - 12x + 36} \cdot (x^2 - x - 30)$

24. $\frac{12x^8y}{5y^5} \div \frac{3y^2}{x^2}$ **25.** $\frac{6x^2 + x - 1}{4x^3 + 4x^2} \div \frac{6x^2 - 2x}{x^2 - 4x - 5}$ **26.** $\frac{x^2 - 4x - 32}{2x^2 - 13x - 24} \div \frac{x}{4x^2 - 9}$

8.5 **Add or subtract the expressions. Simplify the result.**

27. $\frac{x^2}{x + 1} - \frac{1}{x + 1}$ **28.** $\frac{x + 5}{x + 6} + \frac{1}{x - 2}$ **29.** $\frac{5}{x + 2} + \frac{35}{x^2 - 3x - 10}$

8.5 **Simplify the complex fraction.**

30. $\dfrac{\frac{x}{2x + 1}}{5 + \frac{3}{x}}$ **31.** $\dfrac{\frac{x}{3} + 2}{\frac{1}{x} + 3}$ **32.** $\dfrac{\frac{3}{x^2 - 4}}{\frac{2}{x + 2} - \frac{x + 1}{x^2 - x - 6}}$

8.6 **Solve the equation. Check for extraneous solutions.**

33. $\frac{7}{3x - 7} = \frac{14}{x + 1}$ **34.** $\frac{1}{3} + \frac{2}{x} = -\frac{3}{x^2}$ **35.** $2 - \frac{4}{x + 2} = \frac{2}{x}$ **36.** $\frac{4}{x - 2} + \frac{6x^2}{x^2 - 4} = \frac{3x}{x + 2}$

EXTRA PRACTICE