Simplify:

28. $\dfrac{y+9}{9+y} = \dfrac{y+9}{y+9} = 1$

30. $\dfrac{y-9}{9-y} = \dfrac{y-9}{(-1)(-9+y)} = \dfrac{y-9}{(-1)(y-9)} = \dfrac{1}{-1} = -1$

32. $\dfrac{3}{9x+6} = \dfrac{3}{3(3x+2)} = \dfrac{1}{3x+2}$

36. $\dfrac{3x-9}{4x-16} = \dfrac{3(x-3)}{4(x-4)}$

38. $\dfrac{-4x-4y}{x+y} = \dfrac{-4(x+y)}{1(x+y)} = -4$

40. $\dfrac{9x+99}{x^2+11x} = \dfrac{9(x+11)}{x(x+11)} = \dfrac{9}{x}$

46. $\dfrac{x^4-10x^3}{x^2-17x+70} = \dfrac{x^3(x-10)}{(x-10)(x-7)} = \dfrac{x^3}{x-7}$

48. $\dfrac{4x^2+24x}{x+6}$

$= \dfrac{4x(x+6)}{1(x+6)} = 4x$

54. $\dfrac{5x^2 - 500}{35x + 350}$

56. $\dfrac{49 - y^2}{y - 7}$

$$\frac{5x^2-500}{35x+350} = \frac{5(x^2-100)}{35(x+10)} = \frac{5(x+10)(x-10)}{35(x+10)}$$

$$= \frac{x-10}{7}$$

$$\frac{49-y^2}{y-7} = \frac{(7+y)(7-y)}{y-7} =$$

$$\frac{(7+y)(-1)(-7+y)}{y-7} = -(7+y)$$

$$-7-y$$

58. $\dfrac{x^2 - 16}{x^2 - 8x + 16}$

60. $\dfrac{m^2 - 4m + 4}{m^2 + m - 6}$

62. $\dfrac{24y^2 - 8y^3}{15y - 5y^2}$

$$\frac{x^2-16}{x^2-8x+16} = \frac{(x+4)(x-4)}{(x-4)(x-4)} = \frac{x+4}{x-4}$$

$$\frac{m^2-4m+4}{m^2+m-6} = \frac{(m-2)(m-2)}{(m+3)(m-2)} = \frac{m-2}{m+3}$$

$$\frac{24y^2-8y^3}{15y-5y^2} = \frac{8y^2(3-y)}{5y(3-y)} = \frac{8y}{5}$$

64. $\dfrac{ab + ac + b^2 + bc}{b + c}$

66. $\dfrac{xy - 6x + 2y - 12}{y^2 - 6y}$

72. $\dfrac{2xy + 2x - 3y - 3}{2xy + 4x - 3y - 6}$

7.2: Multiplying and Dividing Rational Expressions

Ex: (p 442)

2. $\frac{9x^2}{y} \cdot \frac{4y}{3x^3}$

4. $\frac{6x^2}{10x^3} \cdot \frac{5x}{12}$

6. $-\frac{9x^3y^2}{18xy^5} \cdot y^3$

8. $\frac{4x - 24}{20x} \cdot \frac{5}{x - 6}$

10. $\frac{x^2 + x}{8} \cdot \frac{16}{x + 1}$

16. $\frac{x^2 + 9x + 20}{x^2 - 15x + 44} \cdot \frac{x^2 - 11x + 28}{x^2 + 12x + 35}$

18. $\frac{9y^4}{6y} \div \frac{y^2}{3}$

20. $\frac{7a^2b}{3ab^2} \div \frac{21a^2b^2}{14ab}$

22. $\frac{(x + 3)^2}{5} \div \frac{5x + 15}{25}$

26. $\dfrac{(m-n)^2}{m+n} \div \dfrac{m^2-mn}{m}$

28. $\dfrac{x-3}{2-x} \div \dfrac{x^2+3x-18}{x^2+2x-8}$

30. $\dfrac{x+1}{(x+1)(2x+3)} \div \dfrac{20x+100}{2x+3}$

7.3: Adding and Subtracting Rational Expressions with Common Denominators and Least Common Denominator

Ex: (p 449)

2. $\frac{x+1}{7} + \frac{6}{7}$

4. $\frac{3p}{2q} + \frac{11p}{2q}$

6. $\frac{8y}{y-2} - \frac{16}{y-2}$

10. $\frac{x^2+9x}{x+7} - \frac{4x+14}{x+7}$

12. $\frac{3y}{y^2+3y-10} - \frac{6}{y^2+3y-10}$

18. $\frac{6x^2}{2x-5} - \frac{25+2x^2}{2x-5}$

7.4: Adding and Subtracting Rational Expressions with Unllike Denominators

Ex: (p 455)

2. $\frac{15}{7a} + \frac{8}{6a}$

4. $\frac{4c}{d} - \frac{8d}{5}$

10. $\frac{5}{x-4} + \frac{4x}{x^2-16}$

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

14. $\frac{15}{y-4} + \frac{20}{4-y}$

16. $\frac{5}{a-7} + \frac{5}{7-a}$

18. $\frac{-9}{25x^2-1} + \frac{7}{1-25x^2}$

20. $\frac{7}{x^2} - 5x$

24. $\frac{7}{2x - 3} - 3$

30. $\frac{5x}{6} + \frac{11x^2}{2}$

32. $\frac{5x}{(x - 2)^2} - \frac{3}{x - 2}$

36. $\frac{6}{x} - 1$

40. $\frac{10}{3n - 4} - \frac{5}{4 - 3n}$

42. $\frac{5}{(x + 1)(x + 5)} - \frac{2}{(x + 5)^2}$

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

50. $\dfrac{-1}{a-2}+\dfrac{4}{4-2a}$

54. $\dfrac{-7}{y^2-3y+2}-\dfrac{2}{y-1}$

58. $\dfrac{x+4}{x^2+12x+20}+\dfrac{x+1}{x^2+8x-20}$

7.8: Simlifying Complex Fractions

Ex: (492)

2. $\dfrac{\frac{1}{8}}{-\frac{5}{12}}$

8. $\dfrac{\frac{3}{4}-\frac{1}{2}}{\frac{3}{8}+\frac{1}{6}}$

12. $\dfrac{\frac{7}{10}-\frac{3}{5}}{\frac{1}{2}}$

18. $\dfrac{\frac{x}{2}+2}{\frac{x}{2}-2}$

22. $\dfrac{x-\frac{1}{2x+1}}{1-\frac{x}{2x+1}}$

28. $\dfrac{3}{1-\dfrac{4}{3}}$

30. $\dfrac{\dfrac{m+2}{m-2}}{\dfrac{2m+4}{m^2-4}}$

34. $\dfrac{2+\dfrac{6}{x}}{1-\dfrac{9}{x^2}}$

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

40. $\dfrac{\dfrac{4}{x}+\dfrac{x}{x+1}}{\dfrac{1}{2x}+\dfrac{1}{x+6}}$