

$$72. \frac{\overbrace{2xy + 2x} \quad \overbrace{- 3y - 3}}{\overbrace{2xy + 4x} \quad \overbrace{- 3y - 6}}$$

$$\frac{2x(\underline{y+1}) - 3(\underline{y+1})}{\underline{\hspace{10em}}}$$

$$2x(\underline{y+2}) - 3(\underline{y+2})$$

$$\frac{(y+1) \cancel{(2x-3)}}{(y+2) \cancel{(2x-3)}}$$

$$\frac{y+1}{y+2}$$

## 7.2: Multiplying and Dividing Rational Expressions

EX:  $\frac{2}{3} \cdot \frac{4}{5} = \frac{8}{15}$

$$\frac{3}{4} \cdot \frac{4}{5} = \frac{3}{5}$$

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

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

$$\overset{3}{\frac{\cancel{9}x^{\cancel{2}}}{\cancel{y}} \cdot \frac{4\cancel{y}^1}{\cancel{3}x^{\cancel{3}}}} = \frac{3 \cdot 4}{x} = \frac{12}{x}$$

$$\rightarrow \frac{\overset{12}{\cancel{36}x^{\cancel{2}}\cancel{y}^1}}{\cancel{3}x^{\cancel{3}}\cancel{y}^1} = \frac{12}{x}$$

$$\frac{\frac{1}{6}x^2}{\frac{10x^2}{2}} \cdot \frac{\frac{1}{5}x}{\frac{12}{2}} = \frac{\frac{1}{\cancel{2}x}}{2\cancel{x} \cdot 2} = \frac{1}{4}$$

↙

$$\frac{\frac{30x^2}{4}}{\frac{120x^3}{4}} = \frac{1}{4}$$

Ex: (p 442)

$$6. \quad -\frac{9x^3y^2}{18xy^3} \cdot \frac{y^3}{1}$$

$$-\frac{x^{\cancel{3}^2}y^{\cancel{2}^1}}{2xy^{\cancel{3}^1}} = -\frac{x^2}{2}$$

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

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

$$\frac{4x - 24}{\cancel{20}x} \cdot \frac{\cancel{5}}{x - 6} = \frac{\cancel{4}(x - 6)}{\cancel{4}x(x - 6)} = \frac{1}{x}$$

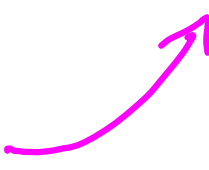
$$\frac{x^2 + x}{\cancel{8}} \cdot \frac{\cancel{16}}{x + 1} = \frac{x(x + 1)\cancel{2}}{\cancel{x+1}} = 2x$$

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

$$\frac{(\cancel{x+5})(x+4)}{(\cancel{x-4})(x-11)} \cdot \frac{(x-7)(\cancel{x-4})}{(x+7)(\cancel{x+5})}$$

$$\frac{(x+4)(x-7)}{(x-11)(x+7)}$$

$$\text{Ex: } \frac{2}{3} \div \frac{4}{5} = \frac{2}{3} \cdot \frac{5}{4} = \frac{5}{6}$$

$$\frac{\frac{2}{3} \cdot \frac{5}{4}}{\frac{4}{5} \cdot \frac{5}{4}} = \frac{\frac{2}{3} \cdot \frac{5}{4}}{1}$$


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

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

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

$$\frac{9y^4}{\cancel{6y}_2} \cdot \frac{\cancel{3}^1}{y^2} = \frac{9y^4}{2y^3} = \frac{9y}{2}$$

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

$$\frac{7a^2b}{3ab^2} \cdot \frac{\cancel{14}^2ab}{\cancel{21}_3a^2b^2} = \frac{14\cancel{a}^1\cancel{b}^1}{9\cancel{a}^1\cancel{b}^1b^4}$$

$$\frac{14}{9b^2}$$

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

$$\frac{(x+3)^2}{\cancel{5}_1} \cdot \frac{\cancel{25}^1}{\cancel{5}_1(x+3)}$$

$$x+3$$

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

$$\frac{(m-n)^2}{m+n} \cdot \frac{\cancel{m}}{\cancel{m}(m-n)}$$

$$\frac{m-n}{m+n}$$

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

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

## 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 Unlike Denominators

Ex: (p 455)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## 7.8: Simplifying Complex Fractions

Ex: (492)

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

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

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

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

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

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

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

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

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

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

