Unit 6.3 Rational Exponents: Product, Power and Quotient Rule

1. Multiply the following using the product rule and simplify as much as possible

   a. $x^{\frac{1}{2}} \cdot x^{\frac{1}{3}} =$ _____

   b. $y^{\frac{2}{3}} \cdot y^{\frac{3}{5}} =$ _____

   c. $2x^{\frac{3}{2}} \cdot 3x^{\frac{2}{3}} =$ _____

   d. $5y^{\frac{1}{7}} \cdot 4y^{\frac{3}{2}} =$ _____

e. $x^{\frac{3}{2}} y^{\frac{1}{2}} \cdot x^{\frac{2}{3}} y^{\frac{2}{3}} =$ _____

f. $5x^{\frac{5}{3}} y^{\frac{1}{7}} \cdot 4x^{\frac{2}{9}} y^{\frac{3}{2}} =$ _____

g. $x^{\frac{3}{2}} \cdot x^{\frac{2}{-5}} =$ _____

h. $5y^{\frac{1}{7}} \cdot 4y^{-\frac{3}{2}} =$ _____

i. $5x^{\frac{-4}{9}} \cdot -3x^{\frac{2}{3}} =$ _____

j. $-5y^{\frac{3}{8}} \cdot -4y^{\frac{-3}{2}} =$ _____

2. Divide the following using the quotient rule and simplify as much as possible

a. $\frac{x^{1/2}}{x^{3/2}} =$ _____

b. $\frac{y^{2/5}}{y^{6/7}} =$ _____

c. $\frac{3x^{1/5}}{6x^{3/8}} =$ _____

d. $\frac{12y^{2/5}}{4y^{6/7}} =$ _____

e. $\frac{2x^{1/3}\,y^{2/3}}{8x^{5/8}\,y^{1/4}} =$ _____

f. $\frac{12x^{2/5}\,y^{2/5}}{4x^{1/3}\,y^{6/7}} =$ _____

g. $\frac{x^{1/5}}{x^{-3/2}} =$ _____

h. $\frac{4y^{-2/5}}{12y^{-3/2}} =$ _____

3. Simplify the following using the power rule and simplify as much as possible

a. $\left(x^{\frac{2}{3}}\right)^{\frac{1}{2}} =$ _____

b. $\left(4x^{\frac{2}{3}}\right)^{\frac{3}{2}} =$ _____

c. $\left(x^{\frac{2}{3}}\right)^{\frac{-3}{5}} =$ _____

d. $\left(3x^{\frac{-2}{3}}\right)^{\frac{5}{2}} =$ _____