

Worksheet Rational & Radicals Functions

1. Given that  $z$  varies jointly as  $x$  and  $y$  and inversely as  $w$  and  $z = 6$  when  $x = 12$ ,  $y = -2$ , and  $w = 5$ . Write the combined variation equation, and find  $z$  when  $x = 7$ ,  $y = 0.2$  and  $w = 14$ .
2. Identify the domain, all holes, and all asymptotes in the graph of the rational function. Then graph.  $f(x) = \frac{2x^2 + 6x}{x^2 - x - 12}$
3. Simplify.  $\frac{24x}{8x^2} \cdot \frac{2x^7}{3x} \cdot \frac{15x}{x^2}$
4. Simplify.  $\frac{x^2 - 2x - 3}{x^2 + x - 20} \div \frac{x^2 + 2x + 1}{x^2 + 6x + 5}$
5. Simplify.  $\frac{x-3}{x-4} \cdot \frac{\frac{2x-8}{x^2-9}}{\frac{x+5}{x+3}}$
6. Simplify.  $\frac{5x-15}{x^2-9} - \frac{2}{x+3}$
7. Simplify.  $\frac{3x^2+x}{12} - \frac{x^2+1}{4}$
8. Simplify.  $\frac{8x-5}{2x+3} + \frac{x+4}{2x+3} - \frac{3x-10}{2x+3}$
9. Identify all holes and all asymptotes in the graph of the rational function. Then graph.  $g(x) = \frac{x-5}{x^2-4}$
10. Simplify.  $\frac{2x+3}{x+3} - \frac{x}{x+2}$

Alg II CC  
Unit 3 – Lesson 2 –  
Worksheet Rational & Radicals Functions

Name \_\_\_\_\_ Pd. \_\_\_\_

Solve each equation.

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

2.  $\frac{1}{t} + \frac{1}{3} = \frac{16}{6t}$

3. Solve the inequality:  $\frac{x+1}{x-2} \leq \frac{1}{x-3}$

4. Find the domain of  $f(x) = \sqrt{x^2-9}$ .

5. Find the inverse of the quadratic function:  $y = x^2 + 8x + 9$

6. Evaluate the expression:  $-2(\sqrt{7})^2 - 4\sqrt[3]{27}$

7. Describe the transformations applied from  $f(x) = \sqrt{x}$  to  $f(x) = \frac{1}{3}\sqrt{x-2}$

Simplify. Assume that the value of each variable is positive. Give your answer in simplest radical form.

8.  $(2x^8)^{\frac{1}{3}} \cdot \sqrt[3]{4x^5}$

9.  $\frac{\sqrt{24x^7y^8}}{\sqrt{6xy^5}}$

10.  $(\sqrt{20}+5) - (2-\sqrt{45})$

11.  $(2\sqrt{3}+1)(5-\sqrt{3})$

12.  $\frac{3}{\sqrt{2}+7}$

Solve each radical equation by using algebra. If the equation has no solution, write *no solution*.

13.  $\sqrt{2x-6} = 4$

14.  $\sqrt{x+2} = x+2$

Solve each radical inequality by using algebra. If the inequality has not solution, write *no solution*.

15.  $\sqrt{x+2} \geq 1$

16.  $\sqrt{x-6} < 1$