

Algebra 2  
Chapter 5 Test Review

Part I: Rational Exponents & Radicals

Write each expression as a radical.

1.  $5^{\frac{1}{3}}$

3.  $(x - 4)^{\frac{2}{3}}$

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

4.  $(3x^2)^{\frac{4}{5}}$

Write each radical with rational exponents.

5.  $\sqrt{10}$

7.  $\sqrt{2x + 1}$

6.  $\sqrt[3]{4x^2}$

8.  $\sqrt[4]{5x^2y^3}$

Part II: Simplifying Radicals

Simplify.

1.  $\sqrt{45x^3y^8}$

6.  $\sqrt[3]{\frac{2}{9x^2}}$

2.  $\sqrt[3]{125x^6y^2}$

7.  $\frac{2-\sqrt{3}}{\sqrt{2}}$

3.  $\sqrt[4]{48v^8z^{13}}$

8.  $\frac{4+\sqrt{6}}{\sqrt{2}}$

4.  $\sqrt{\frac{2}{6x}}$

9.  $\sqrt{2}(3 + \sqrt{5})$

5.  $\sqrt{\frac{5}{3x}}$

10.  $3\sqrt{2}(\sqrt{10} - 4\sqrt{2})$

Part III: Function Operations

Use the functions below to answer the questions.

$$f(x) = -3x + 1$$

$$g(x) = 3x^2 - 4$$

$$h(x) = 2x + 5$$

1.  $(f + g)(x)$

3.  $(g + h)(x)$

5.  $(f \cdot g)(x)$

2.  $(h - f)(x)$

4.  $(f - g)(x)$

6.  $(f \div h)(x)$

Use the functions below to answer the question and state the domain. Evaluate for the given x value.

$$f(x) = -4\sqrt[4]{x}$$

$$g(x) = 2\sqrt[4]{x}$$

7.  $f(x) + g(x); x = 16$

9.  $f(x) \cdot g(x); x = 16$

8.  $f(x) - g(x); x = 81$

10.  $f(x) \div g(x); x = 81$

#### Part IV: Inverse Functions

Determine the inverse for each function.

1.  $y = 3x + 5$

2.  $f(x) = 3x^2 - 4$

3.  $f(x) = \frac{2}{3}x + 1$

4.  $y = \frac{1}{2}x^2 + 4$

5.  $f(x) = \sqrt[3]{x-5}$

6.  $f(x) = 2\sqrt{x} - 3$

Determine if the given relations are inverse functions

7.  $f(x) = 2x - 3$

8.  $f(x) = 4x + 2$

$g(x) = \frac{1}{2}x + 3$

$g(x) = \frac{1}{4}x - \frac{1}{2}$

#### Part V: Radical Functions

Describe each transformation. State the domain and range of each function. Graph the function.

1.  $y = \sqrt{x-3} + 5$

4.  $y = \sqrt{x-4} + 3$

2.  $y = -\sqrt[3]{x+2}$

5.  $y = -\sqrt[5]{x-1} - 4$

3.  $y = -\sqrt[4]{x} - 2$

6.  $y = \sqrt{-x} + 3$

#### Part VI: Radical Equations

Solve each equation.

1.  $\sqrt{x+3} - 2 = 3$

7.  $x^{\frac{2}{3}} + 5 = 8$

2.  $2\sqrt[3]{x-4} = -8$

8.  $-2x^{\frac{3}{4}} - 1 = -7$

3.  $4 - 3\sqrt{2x} = 5$

4.  $\sqrt[4]{3x-1} + 7 = 10$

5.  $2x^{\frac{1}{3}} - 4 = 6$

6.  $(3x)^{\frac{1}{2}} = 5$