Worksheet ---- Radicals

1. Approximate to the nearest .0001:

   (a) $5^{\frac{2}{3}}$ (b) $\sqrt[3]{127}$ (c) $\sqrt[6]{295}$ (d) $\sqrt[4]{-64}$

2. Simplify. Assume that variables can represent any real number.

   (a) $\sqrt{25t^2}$ (c) $\sqrt{4w^2 + 28w + 49}$

   (b) $\sqrt{x^{12}}$ (d) $\sqrt{x^{14}}$

3. Simplify. Assume that no radicands were formed by raising negative quantities to even powers.

   (a) $\sqrt{25t^2}$ (c) $\sqrt{4w^2 + 28w + 49}$

   (b) $\sqrt{x^{12}}$ (d) $\sqrt{x^{14}}$

4. Determine the domain of each function:

   (a) $f(x) = \sqrt{2x - 5}$ (b) $g(x) = \sqrt[3]{7x + 5}$

5. Rewrite without rational exponents and, if possible, simplify:

   (a) $49^{\frac{3}{2}}$ (b) $64^{\frac{2}{3}}$ (c) $27^{-\frac{4}{3}}$

6. Simplify. Assume no radicands were formed by raising negative quantities to even powers.

   (a) $\sqrt{175p^9}$ (b) $\sqrt[3]{128t^8}$ (c) $\sqrt[3]{-27a^5b^{11}}$

7. Perform the indicated operations. Assume even roots are of nonnegative quantities.

(a) $2\sqrt{32} + 7\sqrt{18} - 5\sqrt{20}$

(b) $\sqrt[3]{25y^4}\sqrt[3]{10y^6}$

(c) $\sqrt[5]{a^2b^3}\sqrt[4]{a^2b}$

(d) $\sqrt[4]{12a^3b^7}\sqrt[4]{4a^2b^5}$

(e) $\dfrac{\sqrt[5]{x^4y^2}}{\sqrt[3]{x^2y}}$

(f) $(x - \sqrt[4]{y^3})(3x - \sqrt[5]{y})$

(g) $(\sqrt{5} - \sqrt{2r})^2$

8. Rationalize each denominator:

(a) $\sqrt{\dfrac{3}{5w}}$

(b) $\sqrt[3]{\dfrac{4a^2}{5c}}$

(c) $\dfrac{\sqrt{2} + 3}{\sqrt{5} - \sqrt{2}}$

9. Solve.

(a) $\sqrt{t-7} + 3 = 10$

(b) $\sqrt[3]{y-2} = 3$

(c) $x = \sqrt{2x+9} + 3$

(d) $3 + \sqrt{x-6} = \sqrt{x+9}$

(e) $\sqrt{x+4} + \sqrt{3x+1} = 7$