

Sections 10.1-10.4: Radical Expressions and Graphs, Rational Exponents, Simplifying Radical Expressions, and Adding and Subtracting Radical Expressions

Assume all variables are **positive** real numbers

1. Simplify the following. Express your answers in simplest radical form.

$$-\sqrt{\frac{49}{36}} \qquad -\sqrt{48} \qquad (-64)^{1/2} \qquad \sqrt[3]{-343}$$

$$81^{1/3} \qquad \sqrt{54} \qquad \frac{22}{121^{1/2}} \qquad \sqrt[3]{\frac{16}{8}}$$

2. Perform the indicated operations, expressing your answer in simplest exponent form.

(a) $\sqrt[3]{\sqrt{\sqrt[4]{x}}}$

(b) $\frac{\sqrt[3]{x^5}}{\sqrt[3]{x^7}}$

(c) $\sqrt{\sqrt{\sqrt[4]{x^{32}}}}$

(d) $\frac{\sqrt[3]{x} \sqrt[3]{\frac{1}{x^2}} \sqrt[6]{x}}{\sqrt[6]{\frac{1}{x^3}}}$

(e) $\sqrt[8]{x^5}(3\sqrt[8]{x^5} + 5\sqrt[8]{x^{11}})$

3. Perform the indicated operations. Express your answers in simplest radical form.

(a) $3\sqrt{5} - \sqrt{20} + 2\sqrt{15}$

(b) $x\sqrt{x^3y} - y\sqrt{xy^3}$

(c) $2\sqrt{2} + \frac{\sqrt{2}}{\sqrt{8}}$

4. Find the distance between (8, 13) and (2, 5). Express your solution in simplest radical form.

5. Find the perimeter of a rectangle with sides of length $\sqrt{192}$ and width $\sqrt{48}$. Express your solution in simplest radical form.