1. Write the following in radical or exponential form:

a. $x^{\frac{1}{6}}$

c. $y^{\frac{5}{6}}$

e. $\sqrt[3]{c^{-5}}$

b. $\sqrt[4]{w^3}$

d. $\left(\sqrt[5]{t}\right)^6$

f. $p^{\frac{3}{2}}$

2. Simplify the following:

a. $27^{\frac{2}{3}}$

d. $125^{\frac{2}{3}}$

b. $(-16)^{\frac{3}{2}}$

e. $\frac{24}{4^{3/2}}$

c. $32^{-\frac{1}{5}}$

3. Simplify the following expressions:

a. $a^{\frac{2}{7}} \cdot a^{\frac{4}{7}}$

b. $p^{\frac{1}{4}} \cdot p^{\frac{9}{4}}$

c. $r^{-\frac{4}{5}}$

d. $a^{\frac{3}{4}} \cdot a^{\frac{1}{2}}$

e. $\frac{x^{4/5}}{x^{1/5}}$

f. $\frac{b^3}{c^{1/2}} \cdot \frac{c}{b^{1/3}}$

4. Simplify each expression:

a. $\frac{\sqrt[4]{27}}{\sqrt{3}}$

b. $\sqrt[3]{64z^6}$

c. $\frac{x^{1/2}-2}{3x^{1/2}+2}$

e. $\sqrt[3]{16x^4}$

d. $\frac{\sqrt[4]{32}}{\sqrt[3]{2}}$

f. $\frac{y^{1/2}+2}{y^{1/2}-2}$

ConceptSummary Expressions with Rational Exponents

An expression with rational exponents is simplified when all of the following conditions are met.

- It has no negative exponents.
- It has no exponents that are not positive integers in the denominator.
- It is not a complex fraction.
- The index of any remaining radical is the least number possible.