Working With Radicals

Question 1. Simplify the following radicals as much as possible.

a) $\sqrt{4}$

b) $\sqrt{50}$

c) $\sqrt[3]{27}$

d) $\sqrt[4]{2^5}$

e) $\sqrt{48}$

f) $\sqrt{x^2}$

g) $\sqrt[3]{y^3}$

h) $\sqrt{z^3}$

Question 2. Add or subtract the following radical expressions.

a) $\sqrt{2} + 5\sqrt{2}$

b) $\sqrt[3]{5} + 4\sqrt[3]{5}$

c) $5\sqrt{2} + \sqrt{3} - 3\sqrt{2} + 9\sqrt{3}$

d) $\sqrt{3} + \sqrt{12}$

e) $\sqrt[3]{5} + 3\sqrt{5} - 4\sqrt[3]{5} + 7\sqrt{5}$

Question 3. Multiply the following radical expressions. Simplify your answers as much as possible.

a) $\sqrt{5} \times \sqrt{7}$

b) $\sqrt{2} \times \sqrt{2}$

c) $\sqrt[3]{4} \times \sqrt[3]{4}$

d) $\sqrt[5]{10} \times \sqrt[5]{8}$

e) $\sqrt[3]{x} \times \sqrt[3]{x} \times \sqrt[3]{x}$

Question 4. Divide the following radical expressions. Simplify your answers as much as possible.

a) $\sqrt{10} \div \sqrt{5}$

b) $\sqrt{21} \div \sqrt{7}$

c) $\sqrt[3]{100} \div \sqrt[3]{5}$

d) $\sqrt[5]{49} \div \sqrt[5]{7}$

e) $\sqrt{x^6} \div \sqrt{x^2}$

Question 5. Write the following radical expressions as exponential expressions.

a) $\sqrt{5}$

b) $\sqrt[3]{10}$

c) $\sqrt[5]{3^2}$

d) $\sqrt{x}$

e) $\sqrt[4]{y^7}$

Question 6. Write the following exponential expressions as radical expressions.

a) $6^{\frac{1}{2}}$

b) $7^{\frac{1}{2}}$

c) $z^{\frac{1}{3}}$

d) $x^{\frac{4}{5}}$

e) $3^{\frac{5}{4}}$

Question 7. Solve for the variable in the following equations.

a) $\sqrt{x} = 3$

b) $\sqrt{x} = -2$

c) $\sqrt{x} + 5 = 9 - \sqrt{x}$

d) $3\sqrt[3]{x} = 5 + 2\sqrt[3]{x}$

e) $1 + \sqrt[5]{x} = 9 - 7\sqrt[5]{x}$

You can check your answers on page 277.