

Section 10.5: Multiplying and Dividing Radical Expressions

Assume all variables are **positive** real numbers

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

$$\frac{7}{\sqrt{11}}$$

$$\sqrt[3]{\frac{16}{9}}$$

$$\sqrt{\frac{32}{125}}$$

$$\sqrt{\frac{72x^6}{y^5}}$$

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

(a) $(3\sqrt{m} + \sqrt{n})^2$

(b) $(3\sqrt{m} - \sqrt{n})^2$

(c) $(3\sqrt{m} - \sqrt{n})(3\sqrt{m} + \sqrt{n})$

(d) $(\sqrt[3]{3} + 6)(\sqrt[3]{3} - 6)$

(e) $\frac{9}{\sqrt{2x} - \sqrt{y}}$

(f) $\frac{6x - \sqrt{8x^2}}{4}$

(g) $\sqrt{x+2} - \frac{4}{\sqrt{x+2}}$

(h) $\frac{4\sqrt{3} + \sqrt{2}}{4\sqrt{3} - \sqrt{2}}$

(i) $\frac{15}{4 + \sqrt{11}} + \frac{33}{\sqrt{11}}$

Section 10.6: Solving Equations with Radicals

3. Solve the following radical equations. Your answer should be a **real** number.

(a) $2\sqrt[3]{1-3x} + 3 = 1$

(b) $\sqrt{x+3} - \sqrt{1+2x} = 0$

(c) $\sqrt{x+7} + \sqrt{2-x} = 0$

(d) $\sqrt{5x+6} - \sqrt{x+3} = 3$

Section 10.7: Complex Numbers

4. Perform the indicated operations and leave your answers in the form $a + bi$

(a) $(i^2 - i^4)i^3$

(b) $(3 + 2i) - (6 - 7i)$

(c) $[(5 - 3i) + (-2 + i)]^2$

(d) $\frac{4 + \sqrt{-25}}{3 - \sqrt{-1}}$