MAT 1033C **Name:** _____
Chapter 7 (Larson 4th edition) **Date:** _____
Practice for the Exam (V2) **Section:** _____

1. Evaluate the expression $\left(\frac{3}{4}\right)^{-3}$

2. Rewrite the expression using only positive exponents and simplify:

   a) $(4x^{-4}y^{9}z^{-2})(3x^{4}y^{0}z^{-2})$

   b) $\dfrac{30x^{-3}y^{6}}{6x^{9}y^{8}z^{7}}$

   c) $\dfrac{3(x^{4}y^{-5})^{-7}}{(2x^{8}y^{-4})^{-2}}$

3. Evaluate each expression in the real number system:

   a) $\sqrt{144}$

   b) $8^{-\frac{2}{3}}$

   c) $-16^{\frac{3}{2}}$

4. Simplify each expression.

   a) $\sqrt[3]{81a^{8}b^{9}}$

   b) $\sqrt{90y^{9}z^{5}}$

5. Perform the operations and simplify. Assume the variables represent positive real numbers.

   a) $\sqrt{27} + \sqrt{45} - \sqrt{75}$

   b) $(\sqrt{5} + \sqrt{3})(\sqrt{15} - \sqrt{5})$

   c) $(3+\sqrt{2})^{2}$

   d) $\dfrac{3}{\sqrt[3]{2a^{2}}}$

   e) $\dfrac{\sqrt{5x^{5}}}{\sqrt{8}}$

6. Fill in the blanks with the numbers necessary to rationalize these expressions.
   (2 points each)

a) $\dfrac{6}{\sqrt[3]{32a^5b^6c^{10}d}} \cdot \dfrac{\sqrt{\qquad}}{\sqrt{\qquad}}$

b) $\dfrac{1}{\sqrt[6]{x^7y^{14}}} \cdot \dfrac{\sqrt{\qquad}}{\sqrt{\qquad}}$

7. Convert each number to standard scientific notation: (2 points each)

a) 73,000,000,000 _____

b) 0.000000056 _____

8. Convert each of the following to decimal notation: (2 points each)

a) 4.36×10^{-4} _____

b) 2.85×10^{7} _____

9. Find all the real solutions to each equation.

a) $\sqrt{x+4} - 6 = -4$

b) $\sqrt{5x - x^2} = \sqrt{6}$

10. Perform the indicated operations. Write your answer in the form $a + bi$.

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

b) $\dfrac{6 + \sqrt{-18}}{3}$

c) $(2 + 3i)(6 - 2i)$

d) $\dfrac{7 + 5i}{2 + 3i}$

e) i^{236}

11. What is the conjugate of $6 + 3i$? _____

Bonus Problems

1. Find all the real solutions to the equation

$1 + \sqrt{x+7} = \sqrt{2x+7}$

2. Rationalize the expression $\dfrac{4\sqrt[4]{3x^2y^5}}{6x\sqrt[4]{64x^6y^{11}z^7}}$