Math 102 Quiz 4 name_____
February 10, 2012

Instructions: Show all your work, and draw a box around your final answer. **No calculators** are allowed.

If your answer would be an imaginary number, write "imaginary" as your answer.

1. Convert $\sqrt[4]{10}$ to exponential form: _____

2. Convert $(-7)^{\frac{8}{9}}$ to radical form: _____

3. Simplify the following radical expressions:

(a) $\sqrt[3]{(-6) \times (-6) \times (-6) \times (-6)}$

(b) $\sqrt{24}$

(c) $\sqrt[7]{q^{16}}$

(d) $\sqrt{5^3 \cdot 2^7}$

(e) $\dfrac{\sqrt{36}}{\sqrt{3}}$

(f) $\sqrt[3]{2} \cdot \sqrt[3]{-4} \cdot \sqrt[3]{2}$

(g) $\sqrt[3]{4a^3} \cdot \sqrt[3]{4}$

(h) $\sqrt{20} \cdot \sqrt{6}$

4. Evaluate:

(a) $(-27)^{\frac{1}{3}}$

(b) $8^{\frac{5}{3}}$

(c) $\sqrt[3]{-1}$

(d) $\sqrt{-9}$

(e) $\left(\frac{1}{4}\right)^{-3}$

(f) $|-4| - |-9|$

(g) $\Big||3-5| - |1-8+2|\Big|$

5. Fill in the blank: $\square \cdot \sqrt[4]{8} = 2$.

Extra credit: The number of bacteria in a culture after t hours has the equation $P(t) = A \cdot B^t$, where A and B are numbers. You don't know A and B. You do know that the population after 1 hour is 20, and the population after 4 hours is 160. Find the population after 2 hours (In other words, find $P(2)$).

Hint: first solve for A and B.