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 $(-10)^{\frac{4}{5}}$ to radical form: _____

2. Convert $\sqrt[5]{29}$ to exponential form: _____

3. Simplify the following radical expressions:

(a) $\sqrt[3]{(-5) \times (-5) \times (-5) \times (-5)}$

(b) $\sqrt[5]{y^{13}}$

(c) $\sqrt{54}$

(d) $\sqrt[3]{9} \cdot \sqrt[3]{9x^3}$

(e) $\sqrt{14} \cdot \sqrt{12}$

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

(g) $\dfrac{\sqrt{24}}{\sqrt{2}}$

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

4. Evaluate:

(a) $\sqrt{-25}$

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

(c) $(-8)^{\frac{1}{3}}$

(d) $\left(\frac{1}{3}\right)^{-2}$

(e) $|-7| - |-8|$

(f) $\Big||1-9+2| - |1-11|\Big|$

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

5. Fill in the blank: $\square \cdot \sqrt[4]{27} = 3$.

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 50, and the population after 4 hours is 400. Find the population after 2 hours (In other words, find $P(2)$).

Hint: first solve for A and B.