Math 0115 Sec 0101 Summer 2007 Pretest

You do not need to put your name on this.

1. Classify the following numbers as: natural (N), integer (Z), rational (Q), and/or real (R) [use all terms that apply]:

   \( \sqrt{3} : \)  \( 0.345 : \)  \( -4 : \)

   \( 0.0100100100001 \ldots : \)  \( \frac{7}{9} : \)  \( \pi : \)

2. Simplify: \( | -4 | - |5| \).

3. If \( A = \{ x : x < 3 \} \) and \( B = \{ x : x \geq -5 \} \), then:
   
   What is \( A \cup B \)?  \( A \cap B \)?  \( B \setminus A \)?

4. Simplify the following:

   \( 8^{\frac{1}{3}} = \)  \( 8^{-\frac{1}{3}} = \)  \( 4^2 + 5^2 = \)

   \( (3 + 6)^2 = \)  \( (x + y)^3 = \)  \( \frac{12x^3y^2}{16 - x^2y} = \)

5. Factor the following:

   \( x^3 + x^2 + 4x + 4 = \)  \( x^2 + 6x + 9 = \)

6. For the following expressions, tell whether or not each is a function. If not, say why. If so, describe the domain of the function:

   \( y = x^3 - 2x + 3 \)  \( y = \pm \sqrt{x} \)  \( y = \frac{x^2 + 4x + 4}{x^2 + 2} \)

7. Find all solutions to the equation: \( x^6 + 17x^3 + 60 = -4 + x^3 \).

8. The sum of three consecutive odd integers is 105. Find the integers.