MthT 430 PreTest

In class August 29, 2007 – Turn in September 5, 2007

Group Work Rules:

- You are encouraged to work together!
- Away from the group, do your own neat write up of the problems.
- Acknowledge the group members and any other person/source you use.

PreTest

The following problems include definitions and proofs which will be developed later in the course. Use your [group's] current understanding of *functions*, *limits*, *continuous functions*, *derivatives*, ..., to try the following problems.

1.
$$\lim_{h \to 0} \frac{e^h - 1}{h}.$$

2. $\lim_{x \to 0} \frac{\sin(x)}{x}.$

3. Express .232323... as a rational number. Hint: .232323... = $23\frac{1}{10^2} + 23\frac{1}{10^4} + 23\frac{1}{10^6} + \dots$

- 4. (True/False) There is a continuous function $f_1(x)$, defined for all real numbers x, which takes on every value exactly once.
- 5. (True/False) There is a continuous function $f_2(x)$, defined for all real numbers x, which takes on every value exactly twice.
- 6. (True/False) There is a continuous function $f_3(x)$, defined for all real numbers x, which takes on every value exactly three times.