Name: _____

PRACTICE EXAM 1 – Math 105 – Fall 2007
Pietro Poggi-Corradini

This exam contains 10 problems, worth a total of 100 points. For the first 6 problems I will give no partial credit, just write your final answer in the corresponding box. For the last 4 problems write out complete solutions and circle or box your answers. The use of books, calculators, cell phones, computers, notes, cheat sheets, and all similar aids is strictly prohibited.

1. Solve $|x-1|<2$ [ ]

2. Rationalize the numerator in $\frac{\sqrt{4+h}-2}{h}$ [ ]

3. Find the line through $(1,0)$ **and slope** $(-2,3)$ [ ]

4. Avg. rate of change of x^2+x **from** $x=-1$ **to** $x=1$ [ ]

5. Complete the square in $2x-x^2$**=** [ ]

6. Find x **where** $x+2x^2$ **attains its minimum value** [ ]

Problem 7: Consider the function $f(x) = 3 - 4x - x^2$. (a) Put it in normal form by completing the squares, (b) sketch its graph and carefully mark all the relevant points, (c) determine if it has a maximum value or a minimum value and if so compute it.

Problem 8: Find x such that $x(2-x)(1-x) < 0$, by first studying the sign of each term in the product and then filling in a sign table.

Problem 9: Choose a, b, c, d in $af(bx+c)+d$ so that the graph of $f(x)=x^2$ is as in (a),(b),(c) below and sketch the new graph.

(a) Shifted by 1 to the left and dilated by 2 vertically.

(b) Dilated by 2 horizontally and flipped about the x-axis.

(c) Flipped about the y-axis and shifted down by 1.

Problem 10: Compute. Show the steps.

$$\left[\left(\frac{5}{4}-\frac{5}{12}\right)\times\left(\frac{7}{10}-\frac{8}{15}\right)-\frac{2}{9}\times\frac{1}{8}\right]\times\left(\frac{4}{3}+\frac{7}{6}+2\right)=$$