21-111 Calculus I - Fall 2004

Homework 1

September 8, 2004

There are 5 problems on this homework. Complete all problems, showing all work. There are ten points available. Five points will be awarded if every questions is attempted and two questions will be graded for the remaining 5 points. Answers given without explanation or justification are not counted as attempted questions. The homework is due at the beginning of the recitation on Thursday Sep. 16.

1. Complet the square for the following two expressions:
   (a) $f(x) = 3x^2 - 7x + 1$
   (b) $g(x) = \pi x^2 + 2x$
2. Solve the following equations for x:
   (a) $\frac{1}{2}x^2 + yx - y^2 = 0$
   (b) $\frac{1}{x+1} + \frac{1}{x} = \frac{3}{x^2+x}$
3. Factor
   $$x^4 - x^3 + 5x^2 + x - 6$$
   by finding the roots and using long divison. (Hint: try out easy if the polynomial is 0 for easy values)
4. Simplify (a) $\frac{\frac{s+1}{s-1}+\frac{s-1}{s+1}}{\frac{1}{s^2-1}}$ (b) $x + \frac{1}{x+\frac{1}{x+\frac{1}{x}}}$
5. Rationalize the denominator:
   (a) $\frac{x^4-36}{x-\sqrt{6}}$ (b) $\frac{2x-6x^2}{\sqrt{4x^2+8x^2}-2x}$