

**Math 151A**

**HW #1, due on Wednesday, April 9**

(you can use a hand calculator or the Bisection Algorithm posted on the class webpage).

**#1** Use the Bisection method to find  $p_3$  for  $f(x) = \sqrt{x} - \cos x$  on  $[0, 1]$ .

**#2** Let  $f(x) = 3(x + 1)(x - \frac{1}{2})(x - 1)$ . Use the Bisection method on the following intervals to find  $p_3$ :

(a)  $[-2, 1.5]$

**#3**

(a) Sketch the graphs of  $y = x$  and  $y = 2 \sin x$ .

(b) Use the Bisection method to find an approximation to within  $10^{-5}$  to the first positive value of  $x$  with  $x = 2 \sin x$ .

**#4** Find an approximation to  $\sqrt{3}$  correct to within  $10^{-4}$  using the Bisection Algorithm (hint: consider  $f(x) = x^2 - 3$ ).

**#5** Find a bound for the number of iterations needed to achieve an approximation with accuracy  $10^{-4}$  to the solution of  $x^3 - x - 1 = 0$  lying in the interval  $[1, 2]$ . Find an approximation to the root with this degree of accuracy.