

Math 1450, Honor Calculus Practice4, Fall 2016.

September 21, 2016

PSID: _____ Name: _____

1. Show that the equation $4x^5 + x^3 + 2x + 1 = 0$ has exactly one real root.

2. If f'' is continuous, show that

$$\lim_{h \rightarrow 0} \frac{f(x+h) - 2f(x) + f(x-h)}{h^2} = f''(x).$$

3. Investigate the family of polynomials given by the equation $f(x) = 2x^3 + cx^2 + 2x$. For what values of c does the curve have maximum and minimum points?

4. A cone-shaped drinking cup is made from a circular piece of paper of radius R by cutting out a sector and joining the edges CA and CB . Find the maximum capacity of such a cup.

