Names: _____ _____ _____

Activity #8: Applications **Calculus I**

1. Use Newton's Method to find a rational approximation to $\sqrt{7}$ which is accurate to 8 decimal digits.

2. Use Newton's Method to find a solution of the following equation to within 5 decimal digits:

$$\cos(x) = 2x$$

3. We know from trigonometry that π is the only solution of the equation $\tan(x) = 0$ in the interval $(\pi/2, 3\pi/2)$. Use Newton's method to find an approximation of π which is accurate to 12 decimal digits. You may find it easiest to use a spreadsheet to do this.

4. Find the best degree 8 polynomial approximation of $f(x) = \cos(x)$ near $x = 0$. Graph both f and your approximating polynomial on the same set of axes (use a computer). Over what interval does it appear that the approximation "good"?