

Math 222 Quiz 6

October 28, 2010

Your Name:

Your Section:

Instructions: Time is 20 minutes and the total score is 10 points. There is one bonus problem.

1. $f(x) = \sqrt{x+1}$. Find the Taylor Polynomial of order 2 $P_2(x)$ (3 terms) generated by f at $x = 0$. Estimate the error when we use $P_2(0.1)$ to calculate $\sqrt{1.1}$ (5 pts)
2. (a). Find $\cos(i)$ (Euler's identity) and r in " $re^{i\frac{\pi}{3}} = 1 + i\sqrt{3}$ ", where $i = \sqrt{-1}$ (2 pts)
(b). Solve the differential equation $\frac{dy}{dx} = 3x^2e^{-y}$ (3 pts)

Bonus(3 pts)

Use Taylor Theorem to calculate:

$$\lim_{x \rightarrow 0} \frac{(e^x - 1 - x)(\sin x - x)}{\sin^5 x} \quad (3 \text{ pts})$$