Quiz 3   Name: _____

Math 1220–7

September 14, 2012

Directions: Show all work for full credit. Clearly indicate all answers. Simplify all mathematical expressions completely. Each question is worth 15 points.

Formulas

Euler's Method

$$D_x \sin^{-1} x = \frac{1}{\sqrt{1-x^2}}, \quad -1 < x < 1$$

$$x_n = x_{n-1} + h$$

$$D_x \cos^{-1} x = -\frac{1}{\sqrt{1-x^2}}, \quad -1 < x < 1$$

$$y_n = y_{n-1} + hf(x_{n-1}, y_{n-1})$$

$$D_x \tan^{-1} x = \frac{1}{1+x^2}$$

$$D_x \sec^{-1} x = \frac{1}{|x|\sqrt{x^2-1}}, \quad |x| > 1$$

1. Use Euler's Method with $h = 0.25$ to approximate the solution of $y' = xy$ with $y(1) = 3$ over the interval $[1, 2]$.

2. Find $\dfrac{dy}{dx}$ if $y = \left(\cos^{-1}(2x^2) \right)\left(\tan^{-1}(e^x) \right)$.

3. Evaluate $\displaystyle\int \frac{1}{1+4x^2}\,dx.$

4. Evaluate $\displaystyle\int_0^{\sqrt{2}/2} \frac{1}{\sqrt{1-x^2}}\,dx.$