Math 001B Assignment 8.1 Name_____

DIRECTIONS To receive full credit, you must provide complete legible solutions to the following problems in the space provided. Transfer all your answers to the space provided on the test paper.

1. Set up an integral that represents the length of the curve. Then use your calculator to find the length correct to four decimal places.

$y = \sqrt{x} - x, \quad 1 \le x \le 4$

2. Use Simpson's Rule with n = 10 to estimate the arc length of the curve. Compare your answer with the value of the integral produced by your calculator. (Round your answer to six decimal places.)

$y = xe^{-x}, \quad 0 \le x \le 5$

3. Find the exact length of the curve.

$y = \ln\left(1 - x^2\right), \quad 0 \le x \le 17$

4. Find the exact length of the curve.

$$x = \frac{y^4}{8} + \frac{1}{4y^2}, \quad 1 \le y \le 2$$

5. The work done to move an object along the path C is given by.

$$\int_C \mathbf{F} \bullet d\mathbf{r} = \int_a^b \langle f(t), g(t) \rangle \bullet \langle x'(t), y'(t) \rangle \, dt$$, Where

$$x(t) = t - 1, y(t) = t + 1, \quad 0 \le t \le 1, \quad F(x, y) = \left\langle \frac{-y}{\sqrt{x^2 + y^2}}, \frac{x}{\sqrt{x^2 + y^2}} \right\rangle$$

Find the work done by the force F to move an object along the path C.
This is a plug I problem the purpose behind it is to see that work can be done along any path.