Due at the beginning of class on the day of Test 1

Direction: Solve the problems in this worksheet on separate sheets of paper. Write your solution neatly. Use standard size paper. Clearly label each problem, and include each problem in the correct order. No ragged edges. Staple multiple pages. At the top of the first page put your name, Math 2414, and the title of the worksheet.Show all work to justify your answer. Answer with insufficient work will receive no credit.

Problem 1: Find arc length

Find the arc length of the given function over the given interval

1. $y = \frac{2}{3}x^{3/2} + 1$ over $[0, 1]$.
2. $y = \ln(\sin(x))$ over $[\frac{\pi}{4}, \frac{3\pi}{4}]$.

Problem 2: Find arc length

Find the arc length of the given function over the given interval

1. $x = \frac{1}{3}(y^2 + 2)^{3/2}$ over $0 \leq y \leq 4$.
2. $x = \frac{y^3}{6} + \frac{1}{2y}$ over $1 \leq y \leq 2$.

Problem 3: Application

The equation

$$y = 10(e^{x/20} + e^{-x/20}), -20 \leq x \leq 20$$

is used to model a cable hung between 2 towers that are 40 meters apart. Find the arc length of the cable between the two towers. (from Larson's calculus).