Exam 2 (Part I)

Due on Friday, December 5, 2008

Name: —————————————————————

This is a closed book exam. Show all significant work and justify all your answers.

1. Compute the arc length along the portion of the cycloid given by the parametric equations
$$x = t - \sin t \quad \text{and} \quad y = 1 - \cos t, \quad \text{for } t \in \mathbb{R},$$
   from the point $(0,0)$ to the point $(2\pi, 0)$.

2. Evaluate the iterated integral
$$\int_0^4 \int_{y/2}^2 e^{-x^2} \ \mathrm{d}x \ \mathrm{d}y.$$

3. Let R denote the parallelogram with vertices $(0,0)$, $(2,2)$, $(3,4)$ and $(1,2)$. Use an appropriate change of variables and the change of variables formula to evaluate the integral
$$\int_R xy \ \mathrm{d}x \ \mathrm{d}y.$$