Math 53 - Multivariable Calculus

Quiz # 1

September 1st, 2011

Exercise 1. *Describe the motion of a particle with position* $\big(x(t), y(t)\big)$*, where* $x(t) = 2\sin(t)$*,* $y(t) = 4 + \cos(t)$ *and* $0 \leq t \leq \pi$*.*

Exercise 2. *Set up an integral, but do not evaluate, that represents the length of the curve given by* $x(t) = t - t^2$*,* $y(t) = \frac{4}{3}t^{3/2}$ *and* $1 \leq t \leq 2$*.*

Exercise 3. *Identify the following curve,*

$$r = 2\sin(\theta) + 2\cos(\theta), \qquad 0 \leq \theta < 2\pi,$$

by finding a Cartesian equation of the curve. (Hint: Start by multiplying both sides by r*, then convert to Cartesian coordinates and complete the square.)*