MATH 116-009 QUIZ 6 / 27 Oct 2006 Name:_____

1. Supposed that a child's throwing toy is (essentially) a two-dimensional piece of plastic lying within $r = 6\theta\sin(\theta)$ (where r is measured in inches), for $0 \leq \theta \leq \pi$. Find the surface area of the toy (the use of numerical integration is fine). (3 points)

2. Now, suppose that the density of the toy is given to be $\delta(\theta) = 1 + \frac{\theta}{2}$ g/in^2. Find the mass of the toy. (Again, using numerical integration is fine.) (3 points)

3. Set up but do not evaluate an expression to find the y-center of mass of a 2 inch wide by 3 inch high rectangular object having a density $\delta(y) = \cos(y)$ g/in^2. (y is the vertical coordinate, which measures the height of the object.) (4 points)