Math 2401 L
Calculus III
Fall 2008, Georgia Tech

Sep 22, 2008

Midterm 1

Time: 50 minutes

1. Compute the area of the triangle with vertices $(1, 0, 1)$, $(2, 1, 0)$, $(1, 1, 1)$.

2. Show that if the speed of a particle is constant, then the velocity vector is perpendicular to the acceleration vector.

3. Find the length of the curve $\mathbf{r}(t) = 3\cos t\,\mathbf{i} + 3\sin t\,\mathbf{j} + 4t\,\mathbf{k}$ from $t = 0$ to $t = 3\pi$.

4. Compute the curvature of $y = x^2$ at the point $(1, 1)$.

5. Sketch the surface $x^2 + 4y^2 - 4z^2 = 4$.