Math 220 Quiz 1 September 25, 2002

Name: _____

1. Consider the parametric curve $\mathbf{x} = \mathbf{f}(t) = t\,\mathbf{i} + \sin 2t\,\mathbf{j} + \cos 2t\,\mathbf{k}$, $t \in [0, 2\pi]$.

   (a) (5 points) Find formulas for the velocity, speed and acceleration at any time t.

   (b) (8 points) Determine the unit tangent vector and the tangential and normal components of acceleration at $t = \pi/4$.

   (c) (7 points) Find the unit normal vector $\mathbf{N}$ and the curvature K at $t = \pi/4$.