AMAT 309   L02   Winter 2003
Quiz 7   30 Minutes

NAME: _____   **ID:** _____

1. Find the mass centre of the planar lamina in the first quadrant bounded by the circle $x^2 + y^2 = 4$, assuming constant density $\delta = 1$.   [30]

2. Consider the vector field $\mathbf{F}(x, y, z) = \langle x^2 + 2yz, e^y, xyz + e^z \rangle$. Determine both $\mathbf{curl\,F}$, $\mathrm{div}\,\mathbf{F}$.   [10]

3. Use a triple integral to find the volume of the region lying inside the cylinder $x^2 + 4y^2 = 4$, above the xy-plane, and below the plane $z = 2 + x$. [30]

4. Evaluate
$$\int \int \int_R (x^2 + y^2 + z^2)dV \ ,$$
where R is the solid cylinder $x^2 + y^2 \leq a^2$, $0 \leq z \leq h$. [30]