Name: _____

Instructions: Use your own scrap paper. Write your answers in the space provided.

1. State the formula for the following, defining what the symbols/variables mean:

(a) a line (3 forms): formula 1: _____ Meanings: _____

formula 2: _____

formula 3: _____

(b) the tangent plane to the surface $F(x, y, z) = k$ at the point (a, b, c):

formula: _____ Meanings: _____

(c) a plane: formula: _____ Meanings: _____

2. Write the general form for $\displaystyle\int\int\int f(x, y, z)\, dV$ in:

(a) Cylindrical coordinates: _____

(b) Spherical coordinates: _____

3. Compute:

(a) $\langle 1, 0, 3 \rangle \times \langle 2, -1, 7 \rangle$ _____

(b) $\langle 3t^2, 4\sin t, 7 \rangle \cdot \langle \cos t, t - 2, 0 \rangle$ _____

4. Set up a triple integral to compute the volume of the region bounded by $z = x^2 + y^2$ and $z = 4$ in the first octant. Include a sketch in your answer.

5. Evaluate the integral set up in problem 4. _____