Last Name: _____

First Name: _____

Student ID: _____

Quiz 10

Question 1. *(5 marks)* Use polar coordinates to find the volume of the solid bounded by the paraboloids $z = 3x^2 + 3y^2$ and $z = 4 - x^2 - y^2$

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Question 2. *(5 marks)* Find the surface area of the part of the sphere $x^2 + y^2 + z^2 = 4$ that lies above the plane $z = 1$.

Question 3. *(5 marks)* Evaluate

$$\iiint_E z\,dV$$

where E is bounded by the cylinder $y^2 + z^2 = 9$ and the planes $x = 0$, $y = 3x$, and $z = 0$ in the first octant.