

Math 233 - Quiz 6

December 7, 2021

Name _____

Score _____

Show all work to receive full credit. Supply explanations when necessary. This quiz is due December 16.

1. (5 points) A triangular prism in the 1st octant is bounded by the planes $y = 0$, $y = x$, $x = 1$, $z = 0$, and $z = 1$. The density of the prism at the point (x, y, z) is given by $\rho(x, y, z) = x^3 + y^2 + z + 1$. Find the z -coordinate of the center of mass. Use your calculator or CAS to evaluate the required integrals.

Turn over.

2. (5 points) Use cylindrical coordinates to find the volume of the solid bounded by the paraboloids $z = 2 - x^2 - y^2$ and $z = x^2 + y^2$. Use your calculator or CAS to evaluate the required integral.