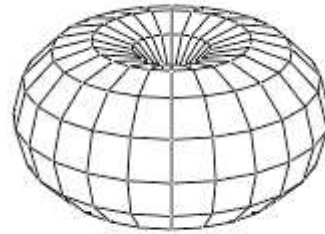


Name_____ ID_____

MATH 251 Quiz 6 Spring 2006
 Sections 506 P. Yasskin

1	/ 5
2	/10
2	/10
Total	/30

1. (5 points) Which of the following integrals will give the volume of the donut given in spherical coordinates by $\rho = \sin \varphi$.



- a. $\int_0^\pi \int_0^{2\pi} \int_0^{\sin \varphi} \rho^2 \cos \varphi \, d\rho \, d\varphi \, d\theta$
- b. $\int_0^\pi \int_0^{2\pi} \int_0^1 \sin \varphi \, d\rho \, d\varphi \, d\theta$
- c. $\int_0^{2\pi} \int_0^\pi \int_0^{\sin \varphi} \rho^2 \sin \varphi \, d\rho \, d\varphi \, d\theta$
- d. $\int_0^{2\pi} \int_0^\pi \int_0^1 \sin \varphi \, \rho^2 \cos \varphi \, d\rho \, d\varphi \, d\theta$
- e. $\int_0^\pi \int_0^{2\pi} \int_0^{\sin \varphi} 1 \, d\rho \, d\varphi \, d\theta$

2. (10 points) Find the average temperature $T_{ave} = \frac{\iiint T \, dV}{\iiint dV}$ inside the region between the paraboloid $z = x^2 + y^2$ and the plane $z = 4$ if the temperature is given by $T = x^2z + y^2z$.

3. (10 points) Compute $\iint (y-x) dx dy$ over the region bounded by the lines $y = x - 1$, $y = x + 2$, $y = 1 - x$, and $y = 2 - x$.

Use curvilinear coordinates.

Half credit for rectangular coordinates.

