Name: SOLUTIONS

Quiz #7 - November 4, 2008

1. Use polar coordinates to find the volume under $z = \sqrt{x^2 + y^2}$ and above the disk $x^2 + y^2 \leq 9$.

$$\int_0^{2\pi} \int_0^3 r^2 \, dr \, d\theta = \int_0^{2\pi} \frac{r^3}{3} \Big|_0^3 \, d\theta$$

$$= \int_0^{2\pi} 9 \, d\theta =$$

$$18\pi$$

2. Write down a triple integral that gives the volume of the tetrahedron T bounded by the planes

$$x + 2y + z = 2, x = 2y \text{ and } z = 0.$$

You do not need to actually compute the integral.

Not a tetrahedron

My mistake,

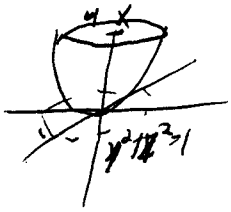
credit for all!

Name: SOLUTIONS

Quiz #8 - November 6, 2008

1. Evaluate the triple integral $\int\int\int_E x dV$ where E is bounded by the paraboloid $x = 4y^2 + 4z^2$ and the plane $x = 4$.

Use cylindrical $x=x$ $y=r\cos\theta$ $z=r\sin\theta$



$$\int_0^{2\pi}\int_0^1\int_{4r^2}^4 x\, r\, dx\, dr\, d\theta = \int_0^{2\pi}\int_0^1 \frac{x^2}{2} r \Big|_{x=4r^2}^{x=4} dr\, d\theta$$

$$= \int_0^{2\pi}\int_0^1 8r - 8r^5\, dr\, d\theta$$

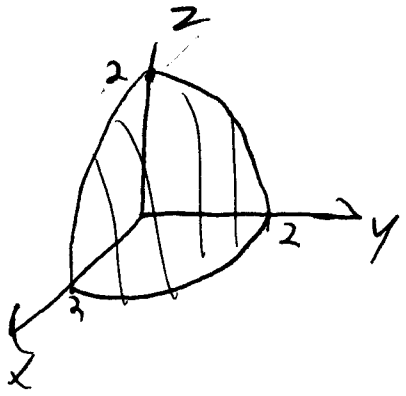
$$= \int_0^{2\pi} 4r^2 - \frac{4}{3}r^6 \Big|_0^1 d\theta$$

$$= \int_0^{2\pi} 4 - 4/3\, d\theta = \int_0^{2\pi} \frac{8}{3} d\theta$$

$$= \boxed{\frac{16\pi}{3}}$$

2. Sketch the solid described in spherical coordinates by the given inequalities:

$$\rho \le 2,\ 0 \le \phi \le \pi/2,\ 0 \le \theta \le \pi/2$$



inside 1/8-sphere