Name: ID #: Section #:

1) [**3pts**] Find the volume of the solid enclosed by the hyperboloid $-x^2 - y^2 + z^2 = 1$ and the plane $z = 2$.

Solution:

2) [**4pts**] Evaluate the integrals

(a) $\iint_D xy \, dA$, D is the disk with center the origin and radius 3

(b) $\int_0^{\sqrt{\pi}} \int_0^x \int_0^{xz} x^2 \sin y \, dydzdx =$

3) [**3pts**] Evaluate

$$\iiint_E \sqrt{x^2 + y^2} \, dV,$$

where E is the region that lies inside the cylinder $x^2 + y^2 = 16$ and between the planes $z = -5$ and $z = 4$.

Solution:

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1) [**4pts**] Evaluate the integrals

(a) $\iint_D \sqrt{4-x^2-y^2}\, dA, \quad R = \{(x,y)|\ x^2+y^2 \le 4, x \ge 0\}$

(b) $\iiint_E yz\cos(x^5)\, dV, \quad E = \{(x,y,z)|\ 0 \le x \le 1,\ 0 \le y \le x,\ x \le z \le 2x\}$

2) [**3pts**] Find the volume of the solid enclosed by the hyperboloid $-x^2 - y^2 + z^2 = 1$ and the plane $z = 2$.

Solution:

3) [**3pts**] Evaluate the integral by changing to cylindrical coordinates

$$\int_{-3}^{3}\int_{0}^{\sqrt{9-x^2}}\int_{0}^{9-x^2-y^2} \sqrt{x^2+y^2}\, dzdydx$$

Solution: