

# Solutions

NAME: \_\_\_\_\_  
SECTION: \_\_\_\_\_

Math 2401 (D1-D3)  
10/15/2014

## Quiz 6

[5 pts.] 1. Compute:

$$\int_0^4 \int_0^\pi \int_0^{2\pi} y \cos(z) dx dy dz.$$

$$\int_0^4 \int_0^\pi \int_0^{2\pi} y \cos(z) dx dy dz = \int_0^4 \int_0^\pi y \cos(z) x \Big|_{x=0}^{x=2\pi} dy dz \quad (1 \text{ pt.})$$

$$= \int_0^4 \int_0^\pi y \cos(z) \cdot 2\pi dy dz \quad (1 \text{ pt.})$$

$$= \int_0^4 \pi \cos(z) \cdot y^2 \Big|_{y=0}^{y=\pi} dz \quad (1 \text{ pt.})$$

$$= \int_0^4 \pi \cos(z) \cdot \pi^2 dz \quad (1 \text{ pt.})$$

$$= \pi^3 \sin(z) \Big|_{z=0}^{z=4} = \quad (1/2 \text{ pt.})$$

$$= \boxed{\pi^3 \sin(4)} \quad (1/2 \text{ pt.})$$

[5 pts.] 2. Compute:

$$\int_1^e \int_1^{e^2} \int_1^{e^3} \frac{1}{xyz} dx dy dz.$$

$$\int_1^e \int_1^{e^2} \int_1^{e^3} \frac{1}{xyz} dx dy dz = \int_1^e \int_1^{e^2} \frac{1}{yz} \ln(x) \Big|_{x=1}^{x=e^3} dy dz \quad (1 \text{ pt.})$$

$$= \int_1^e \int_1^{e^2} \frac{3}{yz} dy dz \quad (1 \text{ pt.})$$

$$= \int_1^e \frac{3}{z} \ln(y) \Big|_{y=1}^{y=e^2} dz \quad (1 \text{ pt.})$$

$$= \int_1^e \frac{3}{z} \cdot 2 dz \quad (1 \text{ pt.})$$

$$= 6 \ln(z) \Big|_{z=1}^{z=e} \quad (1/2 \text{ pt.})$$

$$= \boxed{6} \quad (1/2 \text{ pt.})$$