Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. Parametrize and give bounds for the portion of the paraboloid $x = y^2 + z^2$ between $y = 0$, $y = 2$, $z = 0$, and $z = 3$.
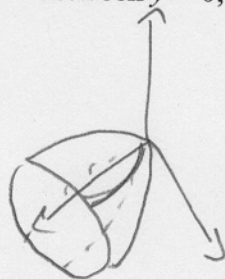
$$X(u,v) = \underline{u^2 + v^2}$$

$$y(u,v) = \underline{u}$$

$$z(u,v) = \underline{v} \quad \text{Good!}$$

$$\underline{0 \le u \le 2}$$

$$\underline{0 \le v \le 3}$$

2. Parametrize and give bounds for the portion of the cylinder with radius 3 centered around the y-axis between $y = 0$ and $y = 5$.
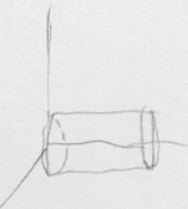
$$X(u,v) = \underline{3\cos u}$$

$$y(u,v) = \underline{v}$$

$$z(u,v) = 3\sin u$$

for $\underline{0 \le u \le 2\pi}$

$\underline{0 \le v \le 5}$

Great

3. Parametrize and give bounds for a sphere with radius 5, centered at the origin.

$$x(u,v) = \underline{5\sin u \cos v}$$

$$y(u,v) = \underline{5\sin u \sin v}$$

$$z(u,v) = \underline{5\cos u}$$

Excellent!

$$\underline{0 \le u \le \pi}$$

$$\underline{0 \le v \le 2\pi}$$