(Easier) Practice Quiz 7 Calc 3 11/15/2005

1. Parametrize and give bounds for the portion of the paraboloid $f(x,y) = 9 - x^2 - y^2$ which lies above the rectangle in the xy-plane with vertices at the origin, (1,0), (1,2), and (0,2).

$x(u,v) = u$
$y(u,v) = v$
$z(u,v) = 9 - u^2 - v^2$

for $0 \le u \le 1$ and $0 \le v \le 2$

2. Parametrize and give bounds for the rectangle in the plane $z = 0$ with vertices (0,0,0), (10,0,0), (10,3,0), and (0,3,0).

$x(u,v) = u$
$y(u,v) = v$
$z(u,v) = 0$

for $0 \le u \le 10$ and $0 \le v \le 3$

3. Paramterize and give bounds for the cylinder centered on the z-axis with radius 5 and between the planes $z = 2$ and $z = 8$.

$x(u,v) = 5 \cos u$
$y(u,v) = 5 \sin u$
$z(u,v) = v$

for $0 \le u \le 2\pi$ and $2 \le v \le 8$

4. Let $\mathbf{F}(x,y,z) = \langle 2x, -z, y \rangle$, and let S be the surface from problem 2 with upward orientation. Evaluate $\iint_S \mathbf{F} \cdot d\mathbf{S}$.

I get 45.

(Harder) Practice Quiz 7   Calc 3   11/15/2005

1. Parametrize and give bounds for the portion of the paraboloid $x = f(y,z) = 9 - y^2 - z^2$ which lies inside the cylinder $y^2 + z^2 = 9$.

$x(u,v) = 9 - u^2 - v^2$
$y(u,v) = u$
$z(u,v) = v$

for $-\sqrt{9-v^2} \le u \le \sqrt{9-v^2}$ and $-3 \le v \le 3$, if you have to list them.

2. Parametrize and give bounds for the parallelogram with vertices (0,0,0), (10,0,0), (10,3,0), and (0,3,0).

$x(u,v) = u$
$y(u,v) = v$
$z(u,v) = 0$

for $0 \le u \le 10$ and $0 \le v \le 3$

3. Paramterize and give bounds for the cylinder centered on the x-axis with radius R and between the planes $x = x_1$ and $x = x_2$. [Notice the change in the problem from the printed version – it makes more sense this way, and this is what I intended in the first place].

$x(u,v) = v$
$y(u,v) = R \cos u$
$z(u,v) = R \sin u$

for $0 \le u \le 2\pi$ and $x_1 \le v \le x_2$

4. Let $\mathbf{F}(x,y,z) = \langle 2x, -z, y \rangle$, and let S be the surface from problem 3 with outward orientation. Evaluate $\iint_S \mathbf{F} \cdot d\mathbf{S}$.

I get 0, because the integrand is actually 0.