

**Exam 3**

Prob.	1	2	3	4	
Value	10	45	25	20	100
Points					

Show all work for credit. Answers with little or no supporting work will receive little or no credit.

1. Sketch the region of integration and change the order of integration:  $\int_0^{\pi/2} \int_0^{\sin x} f(x, y) dy dx$

2. Evaluate the integral. You may need to change coordinate systems or order of integration.

(a)  $\int_0^1 \int_{3y}^3 6e^{x^2} dx dy$

(b)  $\iint_E 0.1e^{-(0.2x+0.5y)} dA$ , where  $E = \{(x, y) \mid 2 \leq x < \infty, 6 \leq y < \infty\}$

(c)  $\iint_D xe^y dA$ , where  $D$  is bounded by  $y = 0$ ,  $y = x^2$ ,  $x = 1$

3. A swimming pool is circular with a 40-ft. diameter. The depth is constant along east-west lines and increases linearly from 2 ft. at the south end to 10 ft. at the north end. Find the volume of water in the pool.

4. Evaluate  $\iiint_E x^2 dV$ , where  $E$  is the solid that lies within the cylinder  $x^2 + y^2 = 2$ , above the plane  $z = 0$ , and below the cone  $z^2 = 9x^2 + 9y^2$ .