

Name: Solution

UIN: _____

Show all your work! Credit will not be given without work.

1) (5 points) Evaluate $\int_0^1 \int_0^x \sin(x^2) dy dx$.

$$= \int_0^1 y \sin(x^2) \Big|_{y=0}^x dx$$

$$= \int_0^1 x \sin(x^2) dx$$

$$= \int_0^1 \sin(u) \frac{1}{2} du$$

$$= \frac{1}{2} -\cos(u) \Big|_{u=0}^{u=1}$$

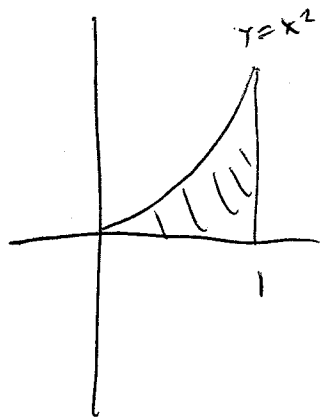
$$= -\frac{1}{2} [\cos 1 - \cos 0]$$

$$= -\frac{1}{2} [(\cos 1) - 1]$$

$$\left[\begin{array}{l} \text{let } x^2 = u \\ 2x dx = du \\ \Rightarrow x dx = \frac{1}{2} du \end{array} \right]$$

2) (5 points) Evaluate $\iint_D x \cos y dA$, where D is the region bounded by

$$y = 0, \quad y = x^2, \quad x = 1.$$



$$\int_0^1 \int_0^{x^2} x \cos y \, dy \, dx$$

$$= \int_0^1 x \sin y \Big|_{y=0}^{y=x^2} \, dx$$

$$= \int_0^1 x \sin(x^2) \, dx$$

$$= -\frac{1}{2} [\cos(1) - 1]$$