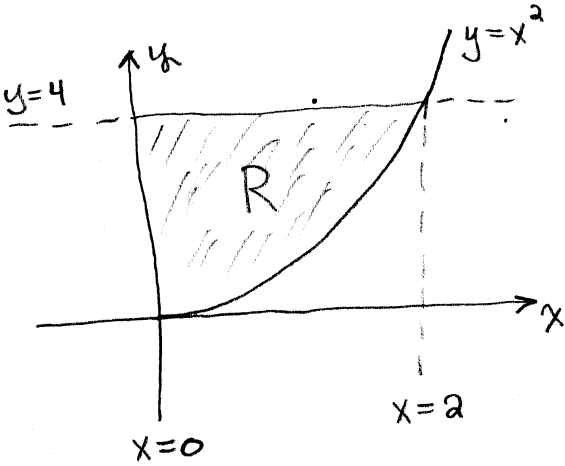# Math 173 - Quiz 10

April 20, 2017

Name __key__

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (7 points) For the following iterated integral, sketch the region of integration, reverse the order of integration, and evaluate your new (reversed-order) iterated integral.

$$\int_0^2 \int_{x^2}^4 x e^{y^2} \, dy \, dx$$

$$\int_{y=0}^{y=4} \int_{x=0}^{x=\sqrt{y}} x e^{y^2} \, dx \, dy$$

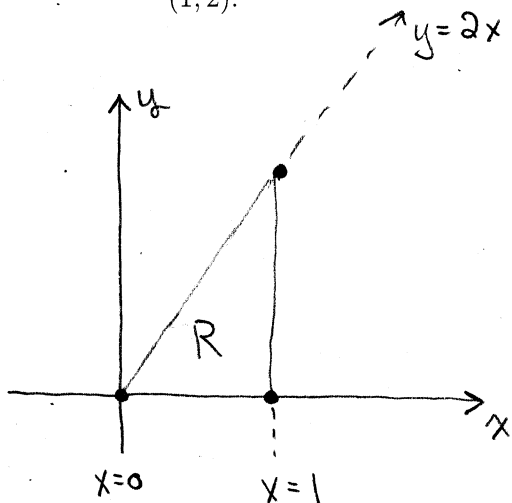$$= \int_0^4 \frac{1}{2} y e^{y^2} \, dy$$

$u = y^2$

$du = 2y \, dy$

$\frac{1}{4} du = \frac{1}{2} y \, dy$

$$= \int_{u=0}^{u=16} \frac{1}{4} e^u \, du$$

$$= \boxed{\frac{1}{4} e^{16} - \frac{1}{4}}$$

2. (3 points) Evaluate $\iint_R x^2 y \, dA$, where R is the triangle with vertices $(0,0)$, $(1,0)$, and $(1,2)$.

$$\int_{x=0}^{x=1} \int_{y=0}^{y=2x} x^2 y \, dy \, dx$$

$$= \int_0^1 \frac{x^2 y^2}{2} \Big|_0^{2x} \, dx = \int_0^1 2x^4 \, dx$$

$$= \boxed{\frac{2}{5}}$$