Consider $f(x,y) = e^{y^3}$ on the domain $D = \{ 0 \leq x \leq 4 , \sqrt{x} \leq y \leq 2\}$.

a) Sketch the region of the domain D.

(3 points)

b) Evaluate the integral $\int\limits_{0}^{4}\int\limits_{\sqrt{x}}^{2} e^{y^3} dy dx$ by reversing the order of integration.

(10 points)

c) Find the average value of the function f over domain D.

(7 points)