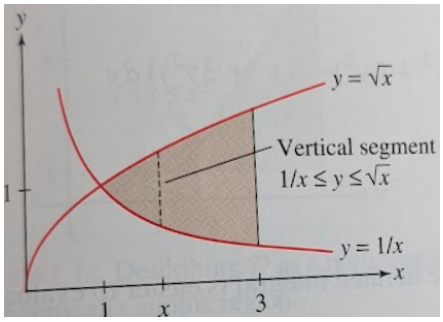
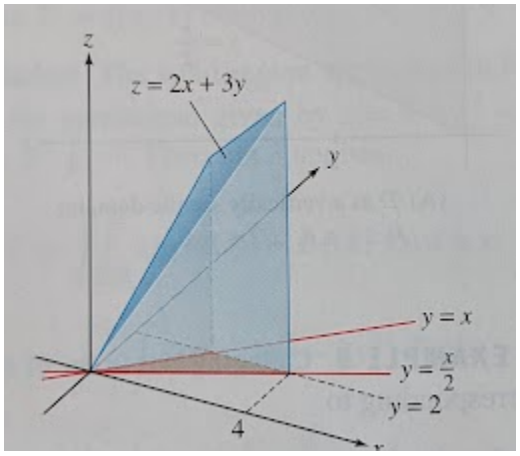
1. Evaluate $\iint_D x^2 y\,dA$, where D is the region in the figure below:



2. Find the volume V of the region between the plane $z = 2x + 3y$ and the triangle D in the figure below:



3. Evaluate $\iint_D e^{y^2}\,dA$ for D: $0 \le x \le 4$, $\frac{1}{2}x \le y \le 2$

4. Sketch the domain of integration D corresponding to $\int_{1}^{9}\int_{\sqrt{y}}^{3} xe^{y}dxdy$ then change the order of integration and evaluate.

5. Find the volume V of the solid bounded above and below by the paraboloids corresponding to $z = 8 - x^2 - y^2$ and $z = x^2 + y^2$ and lying over the domain $D = \{(x, y): \ -1 \leq x \leq 1, \ -1 \leq y \leq 1\}$

6. Evaluate the following:

   a. $\int_{0}^{1} \int_{x-2}^{\cos \pi x} y dy dx$

   b. $\int_{0}^{7} \int_{0}^{\sqrt{y}} 2x \cos x^2 dx dy$

c. $\int_0^8 \int_0^{-x+8} (2x + 5y)^2 dydx$