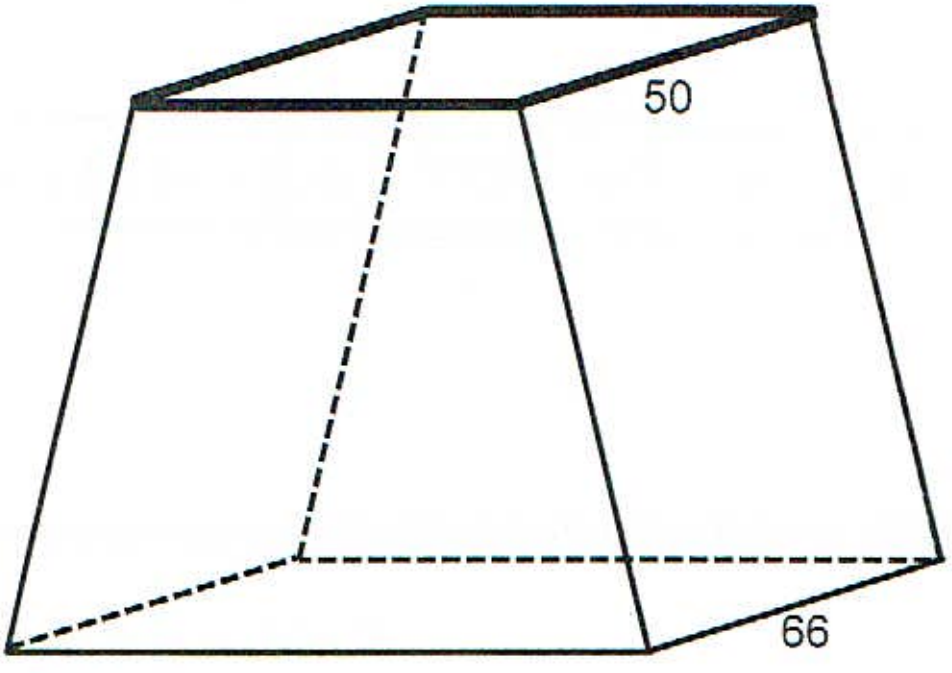
(2) Suppose a 200-foot high-rise is built is the shape of a frustum of a square pyramid (meaning the top of the square pyramid is cut off parallel to the base). The foundation side length is 66 feet and the roof side length is 50 feet.

(a) Determine an integral that would calculate the volume using the slicing method. Hint: Let $s(x)$ = the side length at x feet from the bottom. $s(x)$ is a linear function and we have $s(0) = 66$, $s(200) = 50$

$V =$



(b) Find the volume.

$V =$

(3) A steel nut is to be designed to have the shape of the solid generated by revolving the region bounded by $x = \frac{1}{2}$, $y = \frac{1}{2x}$, $x = 1$ and $y = 0$ around the y-axis (x, y are in units of cm). Find the mass m of the bolt given the density of the steel is 8 g/cm^3

$m =$

(4) Suppose $f(x)$ is continuous and increasing on $[1, 7]$. Furthermore, suppose both points $(1, 2)$ and $(7, 6)$ lie on the graph of $y = f(x)$.

Given $\int_1^7 f(x)\,dx = 21$, determine $\int_2^6 f^{-1}(x)\,dx$.

$\int_2^6 f^{-1}(x)\,dx =$