Section 6.2

After viewing the lecture videos and reading the textbook, you should be able to answer the following questions:

1. The Shell Method about the $y$-axis: $V = \int_a^b 2\pi \cdot r(x) \cdot h(x) \, dx$

Find the volume of the solid generated by rotating the region bound by the curves $y = f(x)$ and $y = g(x)$ over the interval $[a, b]$ about:

a) the $y$-axis.

b) the line $x = M$, where $M \geq b$.

c) the line $x = N$, where $N \leq a$. 
2. The Shell Method about the \( x \)-axis: 
\[
V = \int_c^d 2\pi \cdot r(y) \cdot h(y) \, dy
\]

Find the volume of the solid generated by rotating the region bound by the curves \( x = u(y) \) and \( x = v(y) \) over the interval \([c, d]\) about:

a) the \( x \)-axis.

b) the line \( y = L \), where \( L \geq d \).

c) the line \( y = K \), where \( K \leq c \).

**NOTE:** For the shell method, your “cuts” (the line drawn through the region at either a random value of \( x \) or at a random value of \( y \)) are parallel to the line about which you are rotating.

- You integrate with respect to \( x \) if your cuts are perpendicular to the \( x \)-axis (that is, if your cuts are vertical).
- You integrate with respect to \( y \) if your cuts are perpendicular to the \( y \)-axis (that is, if your cuts are horizontal).