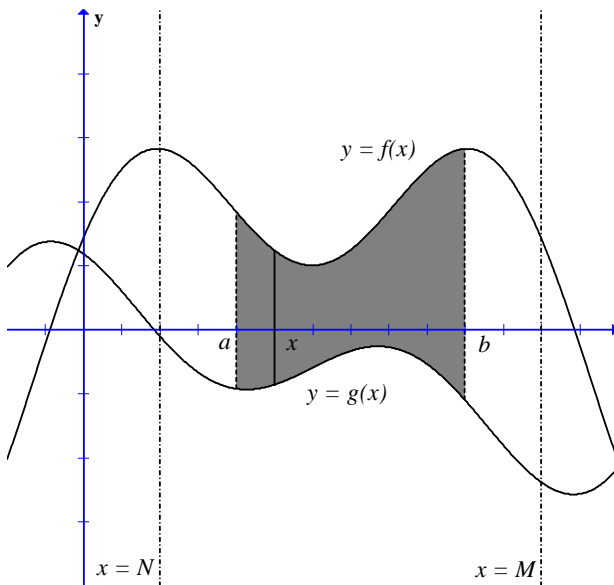**Section 6.2**

After viewing the lecture videos and reading the textbook, you should be able to answer the following questions:
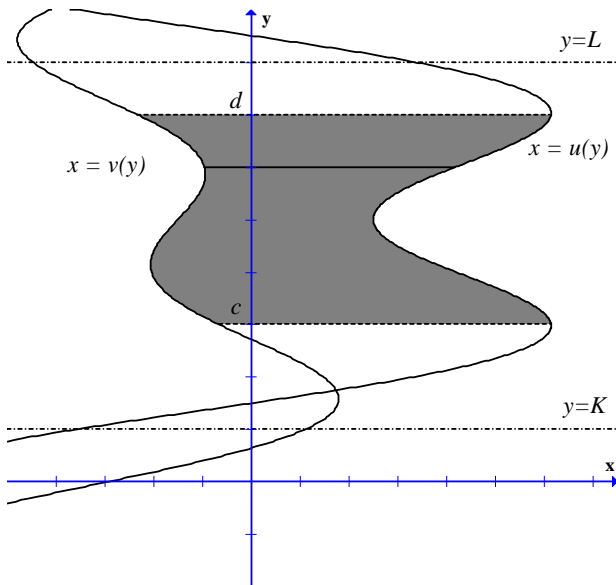
1. **The Shell Method about the y-axis:** $V = \int_a^b 2\pi \cdot r(x) \cdot h(x)\, dx$

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 <u>parallel</u> 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).