0B. Volume of Revolutions. Let's say we revolve some region in the xy-plane around an axis of revolution so we get a solid of revolution. Next we want to find the volume of this solid of revolution.

- **In parts a, fill in the blanks with:** x **or** y**.**
- **In parts b and c, fill in the blanks with a formula involving *some of*:**
  2 , π **, radius ,** $\text{radius}_{\text{big}}$ **,** $\text{radius}_{\text{little}}$ **, average radius , height , and/or thickness .**

►. **Disk/Washer Method.** Let's find the volume of this solid of revolution using the disk or washer method.

a. If the axis of revolution is:

- the x-axis, or parallel to the x-axis, then we partition the x -axis.
- the y-axis, or parallel to the y-axis, then we partition the y -axis.

b. If we use the **disk method**, then the volume of a typical disk is:

π (radius)^2 (height) .

If we use the **washer method**, then the volume of a typical washer is:

π $(\text{radius}_{\text{big}})^2$ (height) $-$ π $(\text{radius}_{\text{little}})^2$ (height) $\overset{\text{or}}{=}$ π $\left[(\text{radius}_{\text{big}})^2 - (\text{radius}_{\text{little}})^2\right]$ (height) .

c. If we partition the z-axis, where z is either x or y, the $\Delta z =$ height .

►. **Shell Method.** Let's find the volume of this solid of revolution using the shell method.

a. If the axis of revolution is:

- the x-axis, or parallel to the x-axis, then we partition the y -axis.
- the y-axis, or parallel to the y-axis, then we partition the x -axis.

b. If we use the **shell method**, then the volume of a typical shell is:

2π (average radius) (height) (thickness) $\overset{\text{or}}{=}$ 2π (radius) (height) (thickness) .

c. If we partition the z-axis, where z is either x or y, the $\Delta z =$ thickness $\overset{\text{or}}{=}$ $\text{radius}_{\text{big}} - \text{radius}_{\text{little}}$.