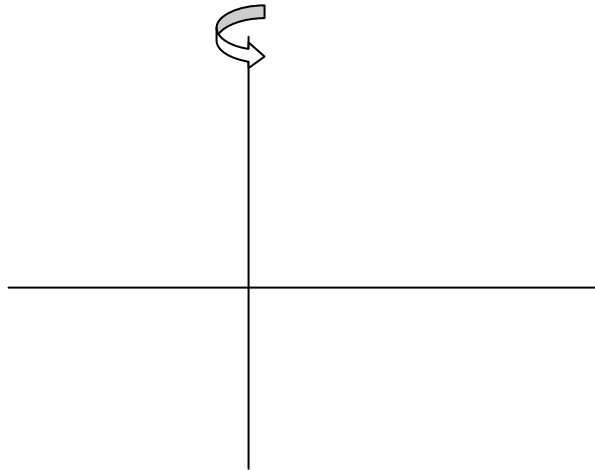
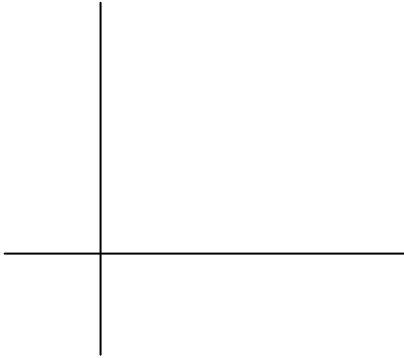


Calculus BC

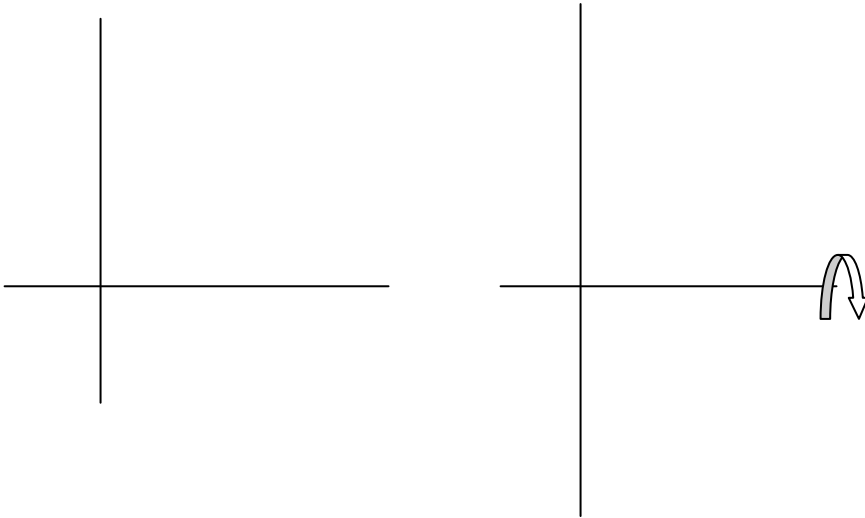
Section 7.3 - Volume - The Shell Method

1. Using cylindrical shells, find the volume of the solid generated by revolving about the y-axis the region bounded by $y = \sqrt{x}$, $x = 1$, and $y = 2$.



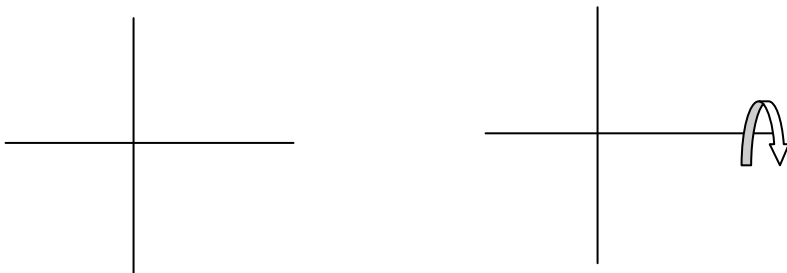
- Take a sample rectangle parallel to the axis of rotation and revolve this about the y-axis. This will create a hollow cylindrical shell with
 - $r =$
 - $h =$
- Open up this shell
 - $l =$
 - $w =$
 - $h =$
- Volume of this shell:
- Volume of solid is the sum of an infinite number of shells:

2. Using cylindrical shells, find the volume of the solid generated by revolving about the x-axis the region bounded by $x = 2y - y^2$ and $y = x$.

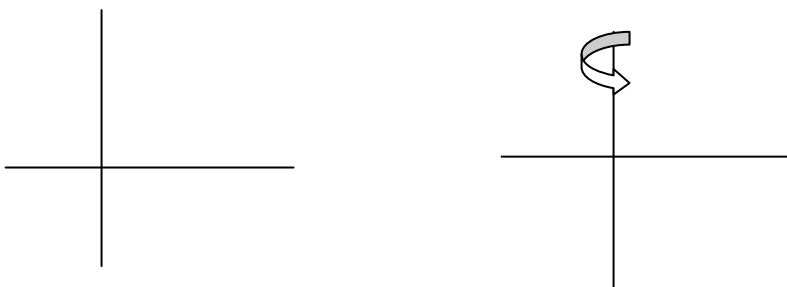


Comparison of Disk and Shell

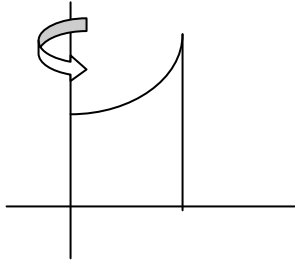
Disk: Representative rectangle is _____ to axis of revolution



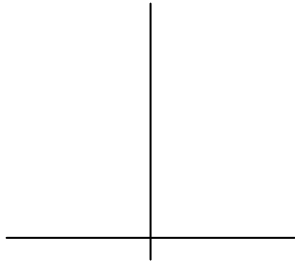
Shell: Representative rectangle is _____ to axis of revolution



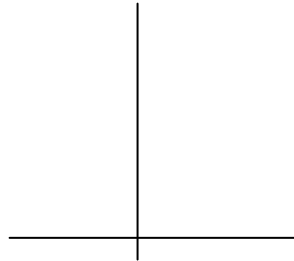
Shell method preferred when:



If disk is used:

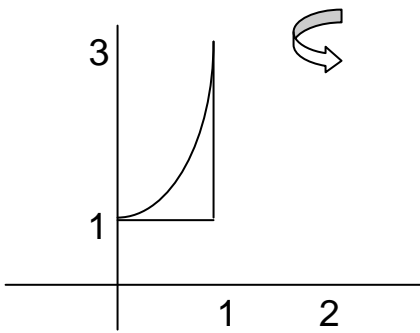


If shell is used:



Shell method is necessary when:

Region bounded by $y = x^3 + x + 1$, $x = 1$, $y = 1$ is revolved about the line $x = 2$



Disk:

Shell: