

1. Let A be the area bounded by $f(x) = \sin(x^2)$ and the x -axis. Find the volume of the solid of revolution formed by rotating A about the y -axis.
 - (a) Draw A and the solid of revolution. What shape are the cross sections?
 - (b) Can you find the area of an arbitrary cross-section $A(y)$?
 - (c) Sketch a cylindrical shell.
 - (d) Can you find its circumference and height?
 - (e) Calculate the volume of the solid.

2. Let A be the area bounded by $y = 1/x$, $y = 0$, $x = 1$ and $x = 2$. Find the volume of the solid of revolution formed by rotating A about the y -axis.
 - (a) Draw A and the solid of revolution.
 - (b) Sketch a cylindrical shell.
 - (c) Find its circumference and height.
 - (d) Calculate the volume of the solid.

3. Let A be the area bounded by $y = 3 + 2x - x^2$ and $x + y = 3$. Find the volume of the solid of revolution formed by rotating A about the y -axis.

4. Let A be the area bounded by $y = x^3$, $y = 0$, and $x = 1$. Find the volume of the solid of revolution formed by rotating A about $y = 1$.