

1. The base of a solid is bounded by  $y = \cos(x)$ , the x-axis,  $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$ . Cross sections perpendicular to the x-axis are squares. Find the volume.
2. The base of a solid is bounded by  $y = 2 - x$ , the x-axis, and the y-axis. Cross sections that are perpendicular to the x-axis are isosceles right triangles with the right angle on the x-axis. (Legs perpendicular to the x-axis). Find the volume.
3. The base of a solid is bounded by the semi-circle  $y = \sqrt{4 - x^2}$  and the x-axis. Cross sections that are perpendicular to the x-axis are squares. Find the volume.
4. The base of a solid is bounded by  $y = \sqrt{16 - x^2}$  and the x-axis. Cross sections that are perpendicular to the y-axis are equilateral triangles. Find the volume.
5. The base of a solid is a circular region in the xy-plane bounded by the graph  $x^2 + y^2 = 9$ . Find the volume of the solid if every cross section by a plane normal to the x-axis is an equilateral triangle with one side as the base.
6. The base of a solid is circular region in the xy-plane bounded by the graph of  $x^2 + y^2 = 9$ . Find the volume of the solid if every cross section by a plane normal to the x-axis is a square with one side as the base.
7. The base of a solid is bounded by  $y = 2 - \frac{1}{2}x$ , the x-axis, and the y-axis. Cross sections that are perpendicular to the y-axis are isosceles right triangles with the hypotenuse in the xy-plane. Find the volume.

**Answers**

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| 1. $\frac{\pi}{2}$         | 5. $36\sqrt{3}$  |
| 2. $\frac{4}{3}$           | 6. 144           |
| 3. $\frac{32}{3}$          | 7. $\frac{8}{3}$ |
| 4. $\frac{128\sqrt{3}}{3}$ |                  |