

Name: _____

For each solid with known cross-section, determine the area of a typical cross-section in terms of x if the cross sections are perpendicular to horizontal axis (or y if the cross sections are parallel to the horizontal axis), and then set up a correct formula for the volume. Present your work neatly on separate paper.

- I. The base of a solid is the region in the x - y plane bounded by the curves $y = \frac{1}{2}x$, $y = 0$ and $x = 4$. Cross-sections perpendicular to the x -axis are
- squares with one side in the base of the solid
 - equilateral triangles with one side in the base of the solid
 - isosceles right triangles with the hypotenuse in the base of the solid
 - isosceles right triangles with one leg in the base of the solid and the right angle vertex on the curve
 - semicircles with the diameter in the base of the solid
- II. The base of a solid is the region in the x - y plane bounded by the curves $y = \sqrt{4-x^2}$ and $y = 0$. Cross-sections perpendicular to the x -axis are
- squares with one side in the base of the solid
 - equilateral triangles with one side in the base of the solid
 - isosceles right triangles with the hypotenuse in the base of the solid
 - isosceles right triangles with one leg in the base of the solid and the right angle vertex on the curve
 - semicircles with the diameter in the base of the solid
- III. The base of a solid is the region in the x - y plane bounded by the curves $y = \sqrt{x}$, $y = 0$ and $x = 4$. Cross-sections perpendicular to the x -axis are
- squares with one side in the base of the solid
 - equilateral triangles with one side in the base of the solid
 - isosceles right triangles with the hypotenuse in the base of the solid
 - isosceles right triangles with one leg in the base of the solid and the right angle vertex on the curve
 - semicircles with the diameter in the base of the solid
- IV. The base of a solid is the region in the x - y plane bounded by the curves $y = 2 - \sin(x)$, $y = 0$, $x = 0$ and $x = \pi$. Cross-sections perpendicular to the x -axis are
- squares with one side in the base of the solid
 - equilateral triangles with one side in the base of the solid
 - isosceles right triangles with the hypotenuse in the base of the solid

- d. isosceles right triangles with one leg in the base of the solid and the right angle vertex on the curve
- e. semicircles with the diameter in the base of the solid

V. The base of a solid is the region in the x-y plane bounded by the curves

$y = \frac{1}{2}x^2 - x + \frac{3}{2}$, $y = 0$, $x = 0$ and $x=3$. Cross-sections perpendicular to the x-axis are

- a. squares with one side in the base of the solid
- b. equilateral triangles with one side in the base of the solid
- c. isosceles right triangles with the hypotenuse in the base of the solid
- d. isosceles right triangles with one leg in the base of the solid and the right angle vertex on the curve
- e. semicircles with the diameter in the base of the solid

VI. The base of a solid is the region in the x-y plane bounded by the curves

$y = \frac{2}{x+1}$, $y = 0$, $x = 0$ and $x = 3$. Cross-sections perpendicular to the x-axis are

- a. squares with one side in the base of the solid
- b. equilateral triangles with one side in the base of the solid
- c. isosceles right triangles with the hypotenuse in the base of the solid
- d. isosceles right triangles with one leg in the base of the solid and the right angle vertex on the curve
- e. semicircles with the diameter in the base of the solid