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

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

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

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

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

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

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

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

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