Volumes by Cross-Section using Pipe Cleaners!   Name: _____

Make sure your volume constructions are neat and accurate please. This sheet along with your built volumes will be collected at the end of class for a grade.
Aim to tape six cross sectional shapes down per base.

1) (no calculator) The base of a solid is the region in the 1st quadrant of the xy-plane bounded by the lines $x = 0, y = 1$, and $x + y = 3$. We will consider a 3D object with this base and whose cross-sections are **perpendicular to the $x-$axis**.

- One group member will create square cross-sections
- One group member will create semi-circular cross-sections
- One group member will create isosceles right triangle cross-sections with one leg on the base

a) Find the general length of one side of the _____ on the base (if you are doing the semi-circle, you should think radius):   (write shape name in blank)

b) Find the **simplified** formula for the area of one general _____ in the solid:

c) Write the set-up for the volume of the solid:
[Tell your group what your set-up is – how are your set-ups similar? How are they different?]

2) (yes calculator) The base of a solid is the region bounded by the graphs of $x = y^2$ and $x = 9$. We will consider a 3D object with this base and whose cross-sections are **perpendicular to the $y-$axis**.

- One group member will create rectangle cross-sections whose length on the $xy-$plane is twice as long as the width
- One group member will create semi-circular cross-sections
- One group member will create isosceles triangle cross-sections whose height is equal to ¼ the length of the triangle base on the xy plane (note: these are not right triangles)

a) Find the general length of one side of the _____ on the base (if you are doing the semi-circle, you should think radius):   (write shape name in blank)

b) Find the **simplified** formula for the area of one general _____ in the solid:

c) Write the set-up for the volume of the solid:
[Tell your group what your set-up is – how are your set-ups similar? How are they different?]