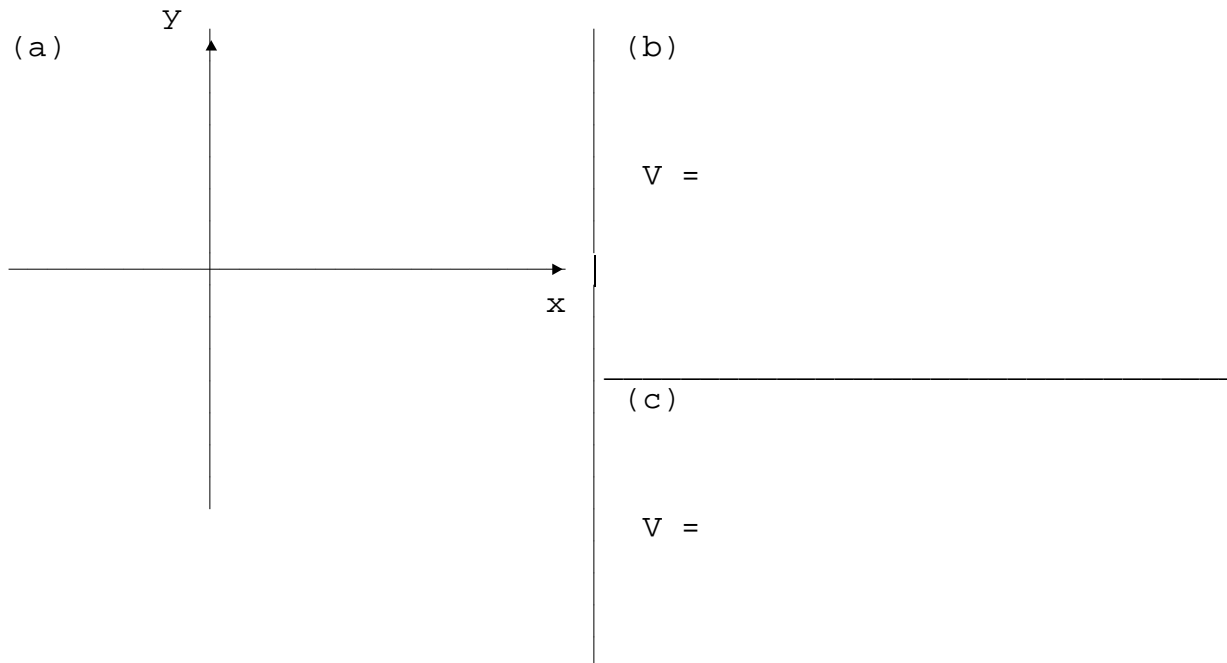


NAME:

MAC2312/Quiz-4

READ ME FIRST: Show me all the magic very neatly on the page, for I do not read minds. Use correct notation when presenting your computations and arguments. Use complete sentences. Remember this: "=" denotes "equals", " \Rightarrow " denotes "implies", and " \Leftrightarrow " denotes "is equivalent to". Since the answer consists of all the magic transformations, do not "box" your final results. Eschew obfuscation.

1. (20 pts.: (a) is 5 points. Remaining parts are 3 points each.)
(a) Very carefully sketch the region R in the 1st quadrant enclosed by the curves defined by $y = \tan^{-1}(x)$, $y = 0$, and $x = 1$. Suppose the region is revolved around the y-axis. (b) Using the method of cylindrical shells, write down the definite integral dx used to compute the volume of the solid of revolution formed. **Don't evaluate the integral.** (c) Using the method of slicing [disks/washers here], write down the definite integral dy used to compute the same volume as in part (b). **Don't evaluate the integral.**



- (d) Write down, but do not attempt to evaluate the definite integral whose numerical value gives the area of the region R above if one integrates with respect to y .

Area =

- (e) Write down, but do not attempt to evaluate the definite integral whose numerical value gives the area of the region R above if one integrates with respect to x .

Area =

- (f) Using one of the integrals from either Part (d) or Part (e) above, compute the exact value of the area of the region R.

Area =