

Present neatly on separate paper. Justify for full credit. No Calculators.  
Name \_\_\_\_\_ Score \_\_\_\_\_ 12 minutes **Weight: 2**

- 1) Consider the region enclosed by  $y = \cos x$ ,  $y = \sin x$  and  $x = 0$  in the first quadrant. Sketch the region neatly and then find:
  - a) The area of the region.
  - b) The volume of the solid formed when the known cross sections are semi-circles perpendicular to the horizontal axis.
  - c) Set up, but do not evaluate, a formula for the volume of the solid formed when the region is revolved about the  $y$ -axis.
  - d) A vertical line  $x=k$  divides the region into two equal parts. Set up, but do not solve, an equation that you would use to find  $k$ .