

1. Find the volume of the solid S . The base of S is the triangular region with vertices $(0,0)$, $(2,0)$ and $(0,3)$. Cross-sections perpendicular to the y -axis are semicircles.
2. Find the volume generated by rotating the region bounded by the curves $y = 4x - x^2$, $y = 3$ about $x = 1$.
3. Find the volume generated by rotating the region bounded by the curves $x = 2y - y^2$, $x = 0$ about y -axis.
4. Given the parametric equations $x = 3t - 5$, $y = 2t + 1$, find a Cartesian equation of the curve. Find the arclength on $0 \leq t \leq 5$.
5. Write out a parametric equation for the circle centered at $(1,2)$ with radius 3. For your parametric equation, draw the graph and indicate with an arrow the direction in which the curve is traced as the parameter increases.
6. Write out the expression to calculate the arclength of the curve given by $y^2 = 4x$, $0 \leq y \leq 2$.