

1. Find the area of the region bounded by the curves  $y = 7 \ln(x)$   
 $y = 4 - x^3 - x$  and the  $x$ -axis
2. A doughnut is formed by rotating the circle of radius 1, and centered at  $(3, 0)$ , about the  $y$ -axis. Find the volume of the resulting doughnut.
3. Complete the exercise we did in the Lab to compute the volume of the solid obtained by rotating the region bounded by  $y = 3x$  and  $y = x^2$  about the  $x$ -axis. (In the lab, the region was rotated about the  $y$ -axis) Use both, the method of disks and cylindrical shells to verify your answer.