# Calculus II - Final practice B

1. Using the method of shells, find the volumes of the solids given by revolving the regions:

- (a) The region enclosed between $-x^2 + 5x$ and $x^2 - 5x + 8$. Rotate about the y-axis.
- (b) The region under the curve $y = \frac{1}{\sqrt{x}}$ for $1 \le x \le 2$. Rotate about the line $x = -2$.
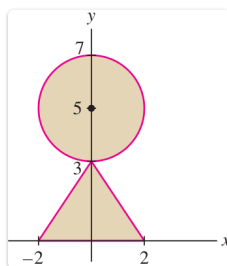
3. Consider the curve $y = x^2$ on $0 \le x \le 1$.

- (a) Set up an integral that computes the arc length of this curve.
- (b) Revolve this curve about the x-axis. Set up an integral for the surface area of the revolution.

4. Set up the integrals that give the hydrostatic force on these shapes:
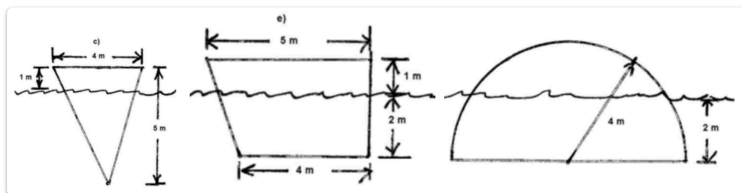
5. Find the CoMs of the regions:
(a) Area under the curve $y = \cos x$ for $0 \le x \le \frac{\pi}{2}$.   (b) See figure:

7. Set up an integral that computes the work done (against gravity) to build a circular cone-shaped tower of height 4m and base radius 1.2m out of a material with mass density $600 \, \text{kg/m}^3$.

8. Use Simpson's Rule with $n = 6$ to approximate the area of the pictured region: