1. Find the area of the region enclosed by the curve $y = x^2 - 2x - 1$ and the line $y = x - 1$.

2. The base of a solid $S$ is the region between $x = y^2$ and $x = 1$. Cross-sections of $S$ perpendicular to the $y$-axis are squares. Find the volume of $S$. 
3. Find the volume of the solid formed by rotating about the the line $x = -2$ the region enclosed by $y = x^2$ and $y = x + 2$. Express your answer as an integral but do not evaluate the integral.

4. Find the volume of the solid formed by rotating about the line $x = -1$ the region enclosed by $x = 1 - y^2$ and the $y$-axis. Express your answer as an integral but do not evaluate the integral.
5. Calculate the arc length of the curve \( y = \frac{2}{3} x^3 + 4 \) for \( 0 \leq x \leq 3 \).

6. Find the \( x \)-coordinate of the centroid of the region enclosed by \( y = 2x - x^2 \) and the \( x \)-axis. It may be useful to know that the area of the region is \( \frac{4}{3} \).
7. Calculate the hydrostatic force against the triangle shown when it is submerged in water so that it’s top edge is at the surface.

8. A 500 lb wrecking ball hangs from a 40 ft chain with linear density 4 lb/ft attached to a crane. How much work is done if the crane lifts the ball 20 ft by drawing in the chain?