1. Let $\mathcal{R}$ be the region bounded by the parabolas $y = x^2$ and $y = 6x - 2x^2$. Set up the integral(s) to find the volume of the solid generated by rotating $\mathcal{R}$ about the indicated line.

   a) the x-axis b) the $y - axis$ c) $x = 3$
   d) $y = 9$ e) $x = 5$ f) $y = 10$
   g) $x = -2$ h) $y = -1$

2. Find the volume of the solid generated by rotating a plane region bounded by $y = 6x - x^2 - 8$ and the line $y = -1$ about the indicated line.

   a) the y-axis b) $x = 1$ c) $y = 2$
   d) $x = -2$ e) $y = -4$

3. A spring has a natural length of 40 cm. If a 60-N force is required to keep he spring compressed 10 cm, how much work is done during this compression? How much work is required to compress the spring to a length of 25 cm.

4. If 16 J of work is needed to stretch a spring from 10 cn o 12 cm and another 10 J is needed to stretch is from 12 cm to 14 cm, what is the natural length of the spring?

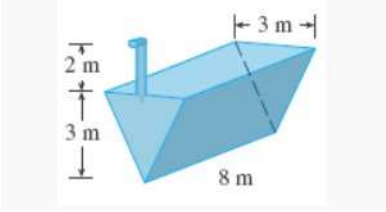
5. A chain is lying on the ground is 10 m long and its mass is 80 kg. How much work is required to raise one end of the chain to a height of 6 m?

6. A rope 40 ft long weighing 6 lb/ft is hanging off the side of a 50 ft tall building. A bucket of rocks weighing 100 lb is attached to the rope. Find the work done by pulling 10 ft of the rope to the top of the building.

7. A heavy rope, ft long, weighs and hangs over the edge of a building ft high.

   (a) How much work is done in pulling the rope to the top of the building?
   (b) How much work is done in pulling half the rope to the top of the building?

8. An 8 meter long tank in the shape of a triangular trough is full of water. Its vertical cross sections are isosceles triangles with base equal to its height of 3 meters.There is a 2 meter spout at the top of the tank. Set up the integral to find the work required to pump out the top 1.5 meters of water from the tank.



9. A tank has a shape of inverted frustum of the cone is half filled with water. Find the work required to empty the tank.