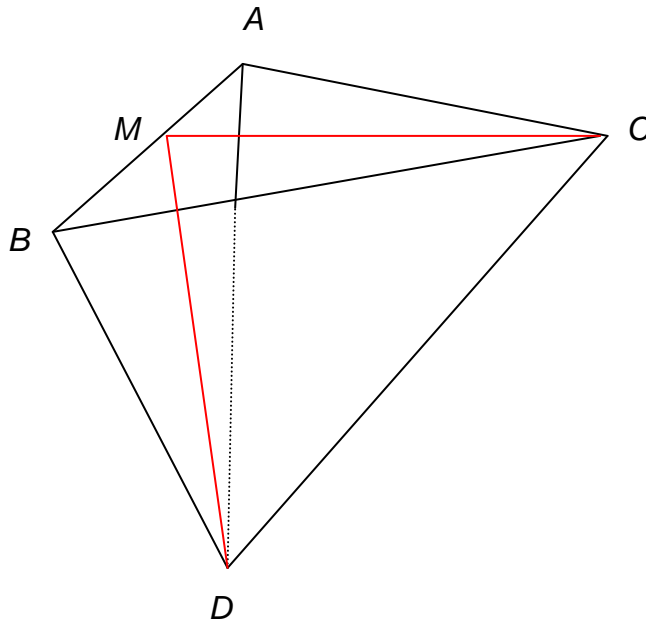


Provide a presentation that is both clear and organized. Show all of your work, simplify results, and give exact values only.

A tank is in the shape of a pyramid as depicted in the following picture. Take into consideration the following qualities that this pyramid possesses:  $\overline{CM} \perp \overline{DM}$ ,  $\overline{CM} \perp \overline{AB}$ ,  $\overline{DM} \perp \overline{AB}$ ,  $\overline{AD} \cong \overline{BD}$ , and  $\overline{AC} \cong \overline{BC} \cong \overline{AB}$ . Also note that  $DM = 30$  m,  $CM = 40$  m, and the triangle  $\triangle ABC$  is parallel to the horizontal.



- i) If this tank is full of water, then how much work is required to pump the water to the top, which is open, so that the water flows out?
- ii) What if the top is closed and there is a spout at the top out from the water flows and the spout is 5 m tall? Assume that the tank is not full, but filled with water whose level is half the height of this tank.