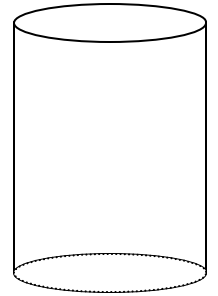


MA 182
Section 6.5

Calculating Work

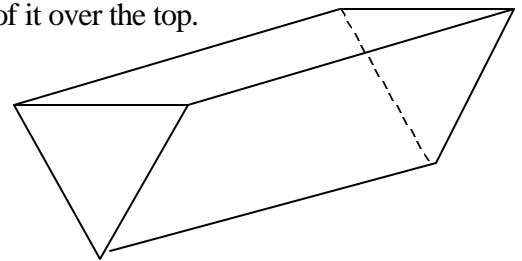
1. A cylindrical tank with diameter 3 m and height 6 m is full of water with density 1000 kg/m^3 . Find the work required to pump all of the water



- (a) over the top rim of the tank
- (b) through a pipe that rises to a height of 4 m above the top of the tank.

2. Redo problem #1 if the tank is only half-full of water.

3. The ends of an 8 ft. long water trough are equilateral triangles having sides of length 2 ft. If the trough is full of water, find the work required to pump all of it over the top. (Water weighs 62.5 lbs/ft^3 .)



Answers

1. (a) $9800(2.25)(18)\mathbf{p} \approx 1,246,898 \text{ J}$ (b) $9800(2.25)(42)\mathbf{p} \approx 2,909,428 \text{ J}$

2. (a) $9800(2.25)(13.5)\mathbf{p} \approx 935,176 \text{ J}$ (b) $9800(2.25)(25.5)\mathbf{p} \approx 1,766,439 \text{ J}$
3. $8(62.5) = 500 \text{ ft-lb}$