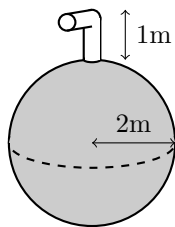
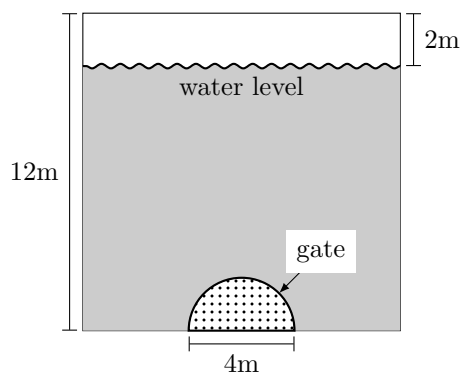


Turn in the following problems at the start of your Thursday recitation section. To receive full credit, please staple your work, and put your name, your section number, and the homework number at the top.

1. The following spherical tank is full of water. Find the work required to pump the water out of the spout. (Assume that there is no water in the spout at the beginning.)



2. A vertical dam has a semicircular gate as shown in the figure below. Find the hydrostatic force against the gate.



3. Sketch the region bounded by the curves $y = 1/x$, $y = 0$, $x = 1$, and $x = 2$. Find the coordinates of the centroid of this region.

(4-9) Determine whether each sequence below converges or diverges. If the sequence converges, find its limit. Carefully show your work!

4. $a_n = \sqrt[n]{7^{1+2n}}$

7. $d_n = \left(1 + \frac{2}{n}\right)^{3n}$

5. $b_n = \frac{(\ln n)^3}{n}$

8. $e_n = \frac{\sqrt{3+9n^4}}{3n^2+4}$

6. $c_n = \frac{n!}{e^n}$

9. $f_n = \frac{\sin 2n}{1 + \sqrt{n}}$