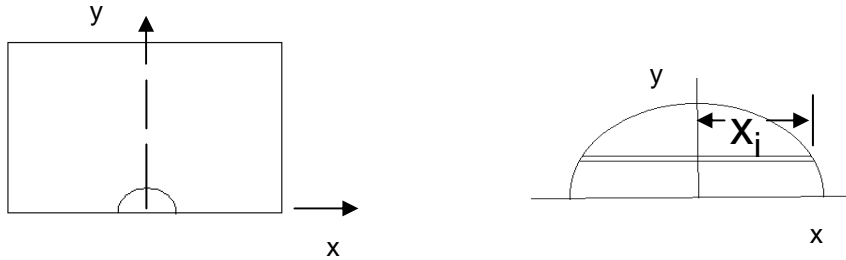


Problem 30, page 481.



The equation of the circle centered at the origin is $x^2 + y^2 = 4$.

Then $F_i = P_i A_i$, with $A_i = 2x_i \Delta y = 2\sqrt{4 - y_i^2} \Delta y$

If $\Delta y \ll 1$ then $P_i \approx \text{constant} = \rho g d_i = \rho g(10 - y_i)$.

So $F_i = P_i A_i = 2\rho g(10 - y_i)\sqrt{4 - y_i^2} \Delta y$

$$F = 2\rho(9.81)\int_0^2 (10 - y)\sqrt{4 - y^2} dy \approx 564.060478805\rho$$