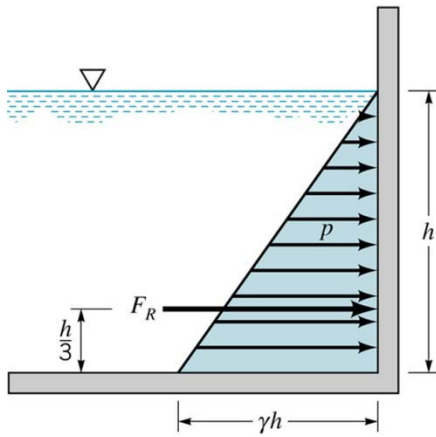
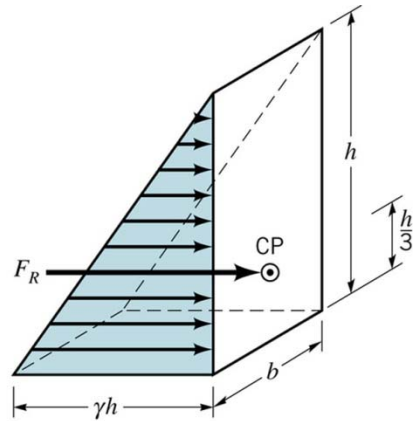


Hydrostatic force on Plane surface



(a)



(b)

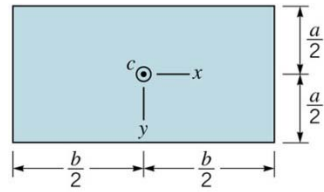
$$h_R F_R = \int_0^h p(h) h dA$$

Example: rectangular wall

$$h_R F_R = \int_0^h \gamma h^2 (\ell dh)$$

$$h_R = \frac{2}{3} h$$

Hydrostatic force on Plane surface



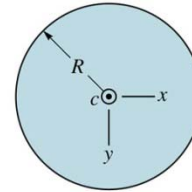
(a) Rectangle

$$A = ba$$

$$I_{xc} = \frac{1}{12} ba^3$$

$$I_{yc} = \frac{1}{12} ab^3$$

$$I_{xyc} = 0$$

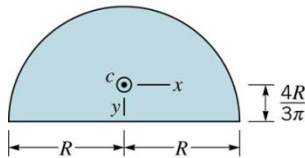


(b) Circle

$$A = \pi R^2$$

$$I_{xc} = I_{yc} = \frac{\pi R^4}{4}$$

$$I_{xyc} = 0$$



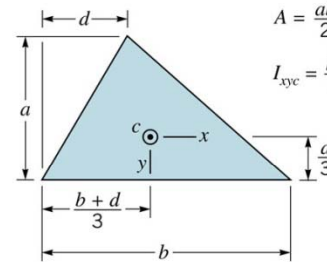
(c) Semicircle

$$A = \frac{\pi R^2}{2}$$

$$I_{xc} = 0.1098R^4$$

$$I_{yc} = 0.3927R^4$$

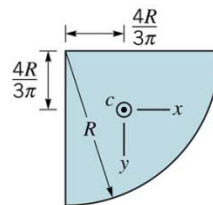
$$I_{xyc} = 0$$



(d) Triangle

$$A = \frac{ab}{2} \quad I_{xc} = \frac{ba^3}{36}$$

$$I_{xyc} = \frac{ba^2}{72}(b - 2d)$$



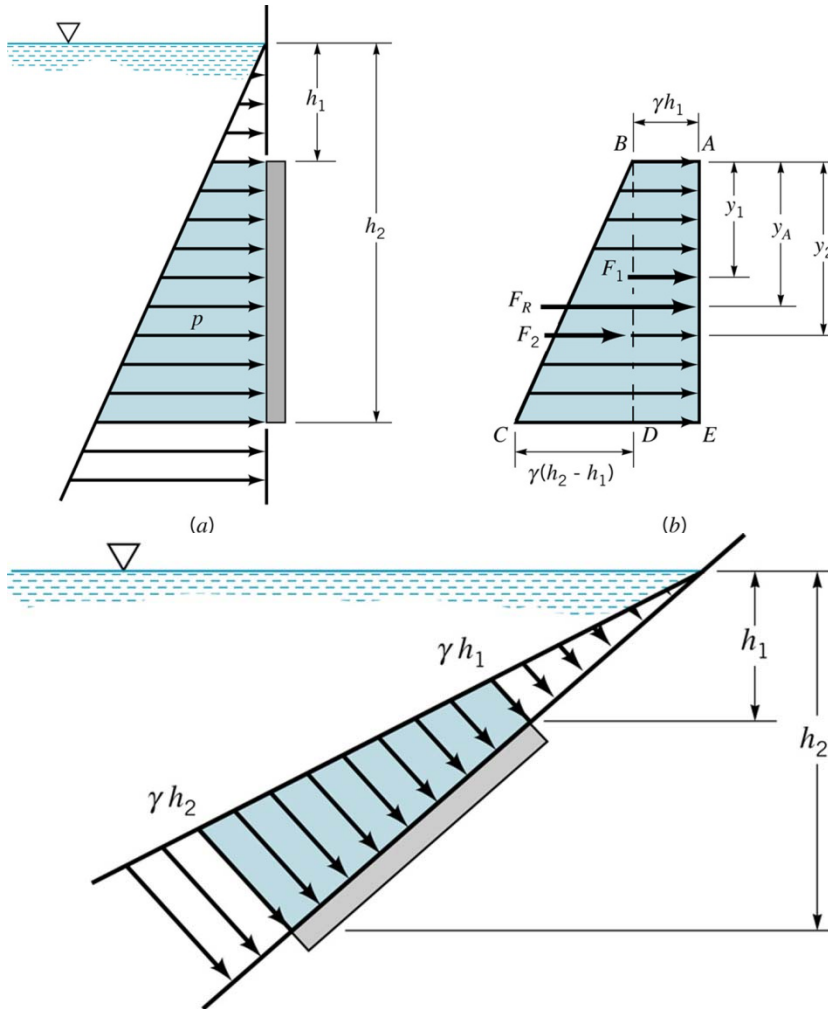
(e) Quarter circle

$$A = \frac{\pi R^2}{4}$$

$$I_{xc} = I_{yc} = 0.05488R^4$$

$$I_{xyc} = -0.01647R^4$$

Hydrostatic force on Plane surface



Pressure prism

$$F_R = F_1 + F_2$$

$$F_R y_A = F_1 y_1 + F_2 y_2$$

$$y_1 = \frac{1}{2}(h_2 - h_1)$$

$$y_2 = \frac{2}{3}(h_2 - h_1)$$