1)

2.3 Pressure on Inclined Surface

Pressure differes here, depending on h.

Surface can be vertical or 45°

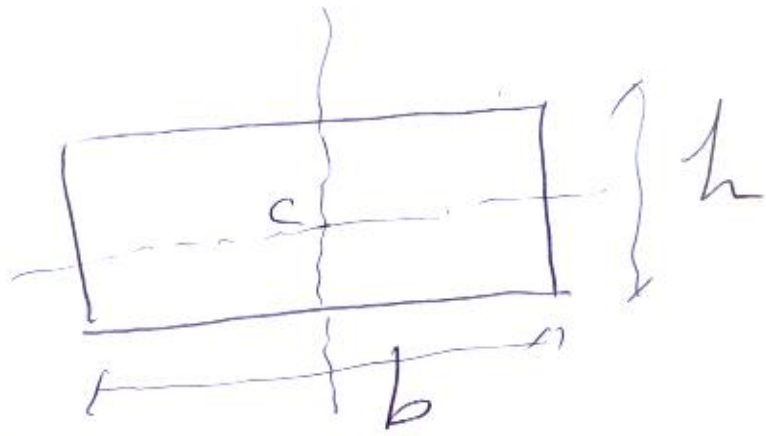* $\quad F = P_c A$

$\quad\quad = \gamma h_c A$
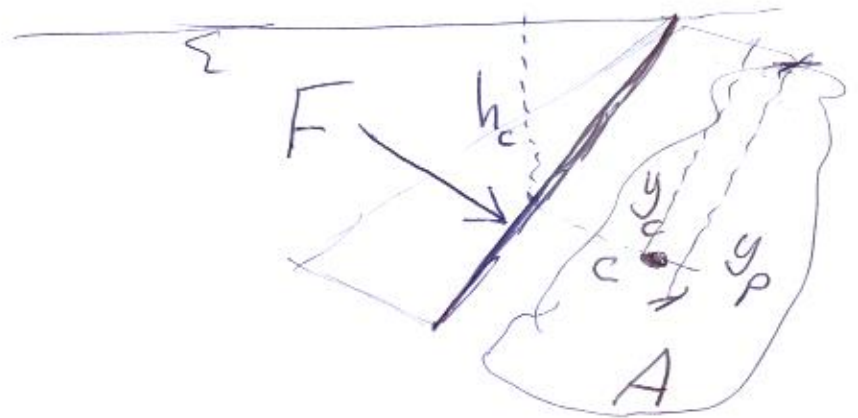
* $\quad y_p = y_c + \dfrac{I_c}{y_c A}$

$\quad\quad I_c$ = moment of inertia after
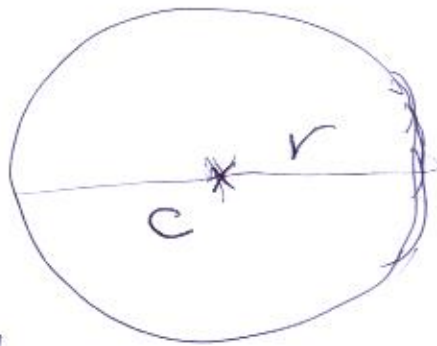$\quad\quad\quad$ the area about centroidal axis

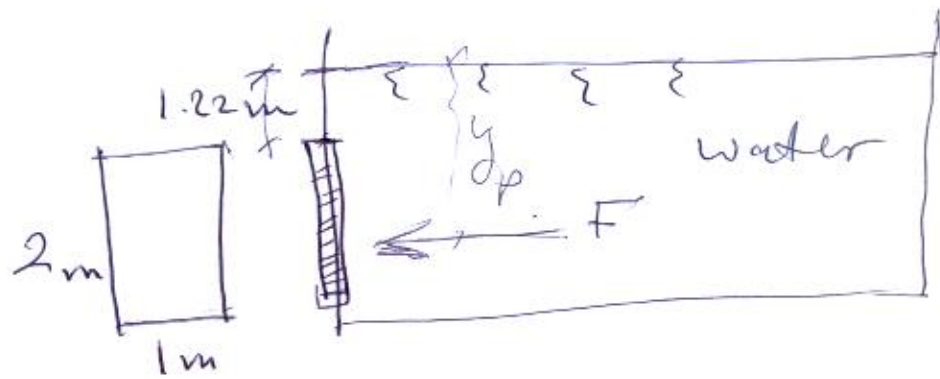2)

$$I_c = bh^3/12$$

$$I_c = bh^3/36$$

$$I_c = \pi r^4/4$$

3)

Ex

Find magnitude of pressure
force on the gate & its point of action.

$$F = P_c A$$

$$= \gamma h_c A$$
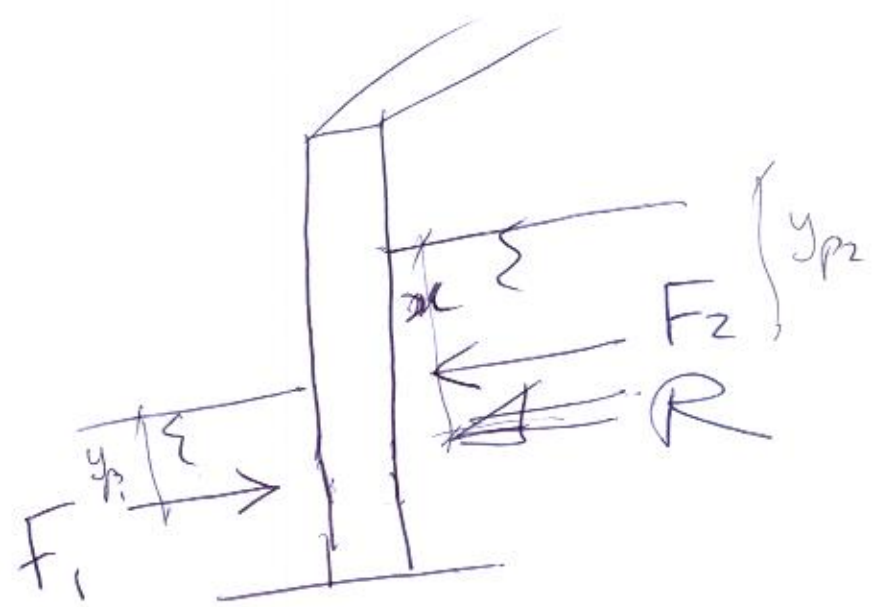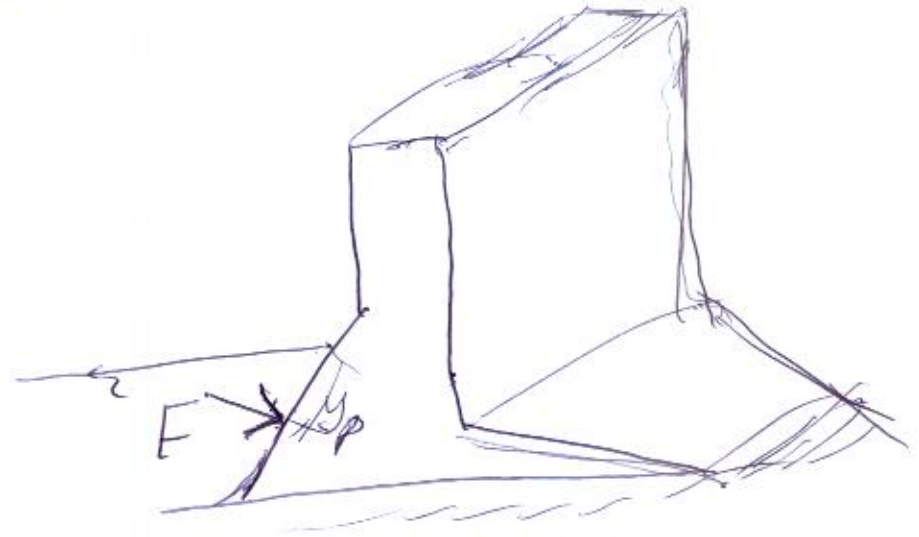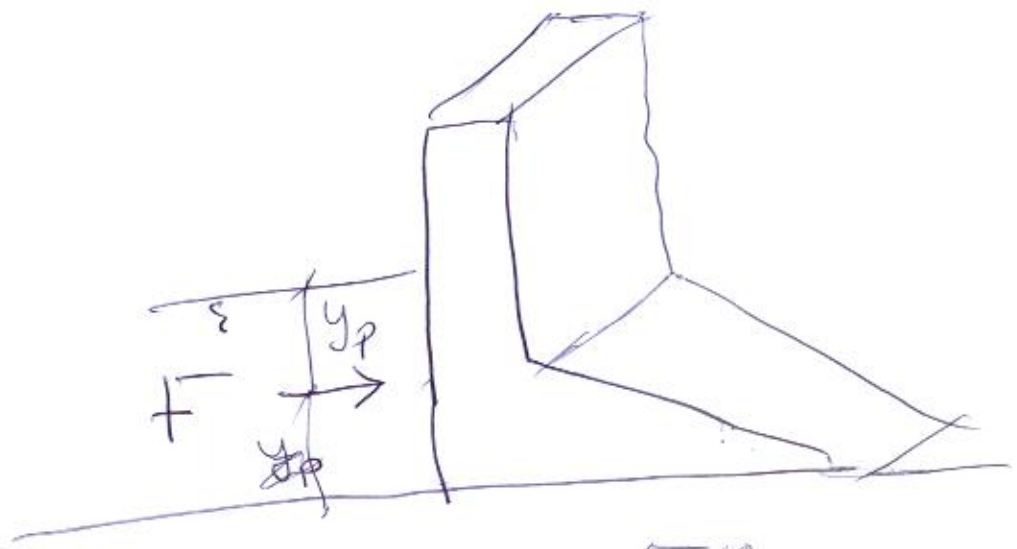
$$= 9810 \ (1.22 + 1) \ (1 \times 2)$$

$$= 43.56 \ KN$$

$$y_p = y_c + I_c / y_e A$$

$$= (1.22 + 1) + \frac{(1 \times 2^3)/12}{(1.22 + 1) \times (1 \times 2)}$$

$$= 2.37 \ m$$

$$R = F_2 - F_1$$
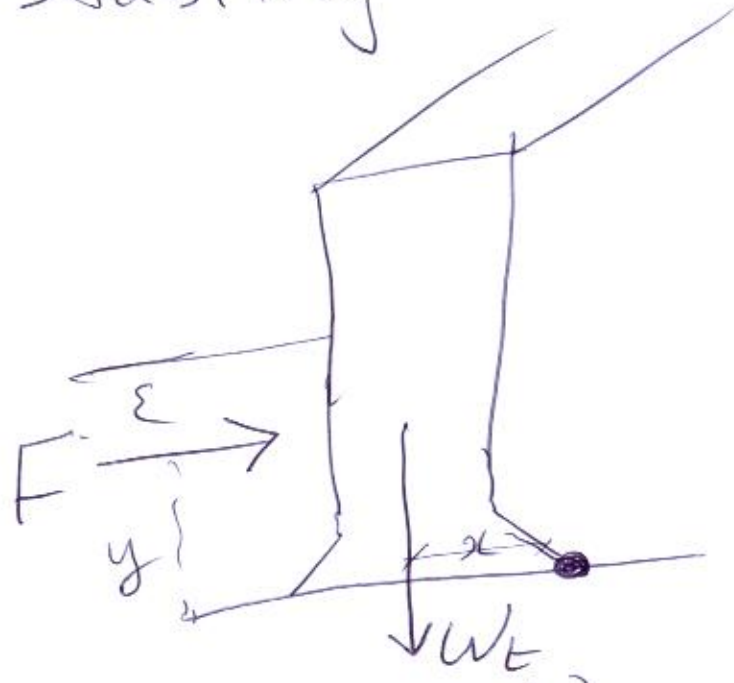
$$Rx = F_2 \, y_{p2} - F_1 \, y_{p1}$$

5) Dam Stability

$F \xrightarrow{\varepsilon}$

y

x

$\downarrow W_t$

1. Crushing (at a point)

2. Sliding (horizontal move $\Longrightarrow$)

$$F = W_t \, f$$

$$f = \text{friction coefficient}$$

3. Overturning (moment on toe)

overturning moment $\nleq$ stability moment

$$(F_y \quad \nleq_s \quad W_t \, x)$$

6) Dams in Saudi Arabia

   * Purposes of dams

   - Flood control
   - Groundwater recharge
   - Power generation
   - Direct use
   - Recreation

* Number of dams in S.A.
   * ≈ 510 (
   mostly gravity dam
   Storge capacity ≈ 2.2 billion
   m3
   Largest one is King Fahad
   Dam , Bishah.