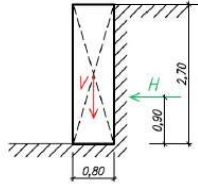


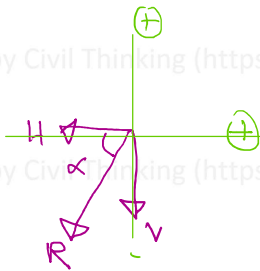
Statics: Force System: **Concurrent Force System** Solved Problem using **graphic method and analytical method**

Please find the resultant force caused by the pressure of ground and by dead weight of a concrete retaining wall as shown at the diagram below.

H = 36 kN (pressure of ground), V = 52 kN (dead weight of wall)



Free body Diagram:



$$R = \sqrt{V^2 + H^2 + 2VH \cos 90^\circ}$$

$$R = \sqrt{V^2 + H^2} = \sqrt{36^2 + 52^2} = \text{Sqrt}((-36)^2 + (-52)^2) = 63.25 \text{ kN}$$

$$\alpha = \tan^{-1} \frac{V}{H} = \tan^{-1} \frac{52}{36} = 55.3^\circ$$

Graphic Method:

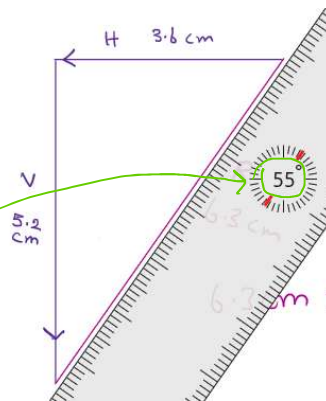
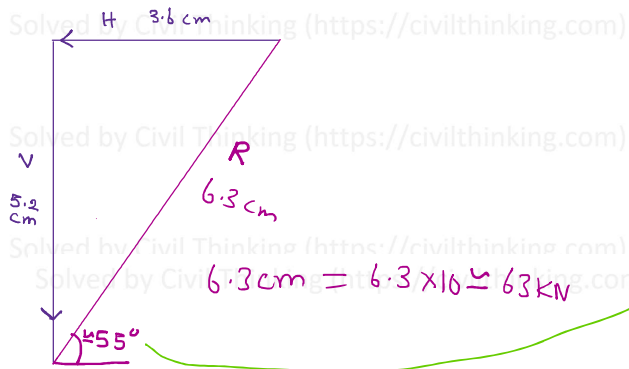


H = 36 kN (pressure of ground), V = 52 kN (dead weight of wall)

$$1 \text{ cm} = 10 \text{ kN}$$

$$H = 36 \text{ kN} = \frac{36}{10} = 3.6 \text{ cm}$$

$$V = 52 \text{ kN} = \frac{52}{10} = 5.2 \text{ cm}$$



This problem was solved by Civil Thinking (<https://civilthinking.com>)

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