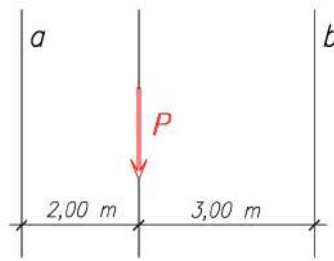


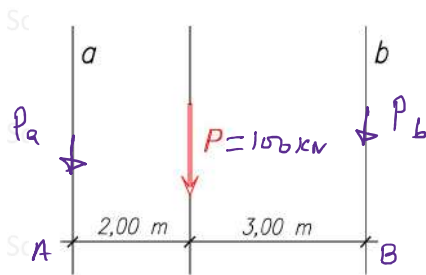
Statics: Force System: **Parallel Force System** Solved Problem
 using **graphic method and analytical method**

Please divide the force $P = 100 \text{ kN}$ into two forces located on the straights a and b parallel to the straight of force P .



Variignon's Theorem:

Moment due to components of a Resultant force at a given point
 = Moment of Resultant about that point.



$$\oplus M_{B, \text{components}} = -(P_a \times 5 \text{ m})$$

$$M_{B, R} = -(P \times 3 \text{ m})$$

$$\cancel{-(P \times 3 \text{ m})} = \cancel{-(P_a \times 5 \text{ m})}$$

$$\oplus M_{A, \text{comp.}} = M_{A, R}$$

$$(P_b \times 5 \text{ m}) = 100 \times 2$$

$$P_b = (100 \times 2) / 5 = 40 \text{ kN}$$

$$300 \text{ kN.m} = P_a \times 5 \text{ m}$$

$$\Rightarrow P_a = 300 / 5 = 60 \text{ kN}$$

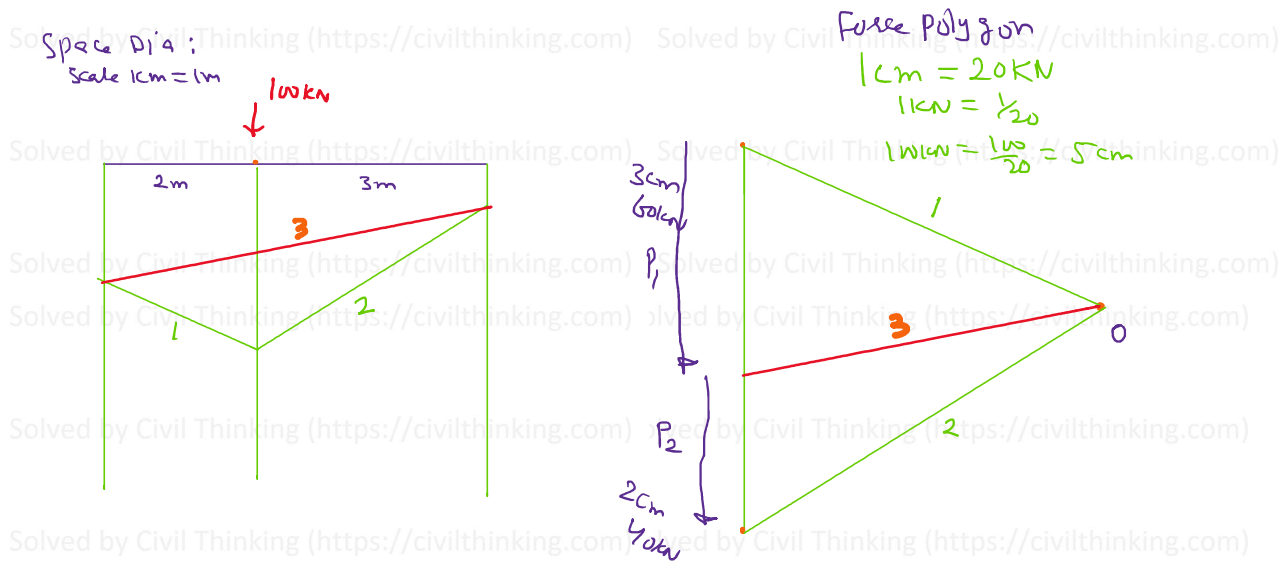
cross check: $\Sigma \text{ comp.} = \text{Resultant}$

$$100 = 40 + 60$$

$$100 = 100 \quad \checkmark$$

[Parallel force system]

Graphic Method:



Cross check: $P = P_1 + P_2$

$$P = 100$$

$$P_1 + P_2 = 60 + 40 = 100$$

$$100 = 100 \quad \checkmark$$

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

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