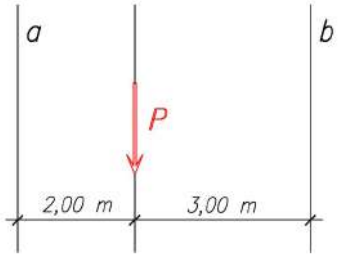
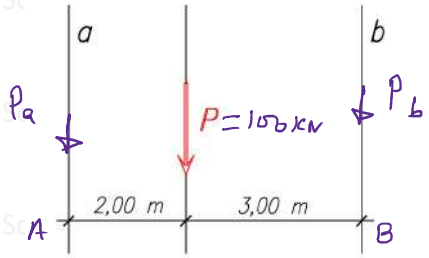
Statics: Force System: **Parallel Force System** Solved Problem using *graphic method and analytical method*

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



Varignon's Theorem:

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



$\circlearrowright^{+} M_{A,comp.} = M_{A,R}$

$(P_b \times 5m) = 100 \times 2$

$P_b =$ (100*2)/5=40kN

$\circlearrowright^{+} M_{B,components} = -(P_a \times 5m)$

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

$-(P \times 3m) = -(P_a \times 5m)$ (P = 100kN)

$300kN.m = P_a \times 5m$

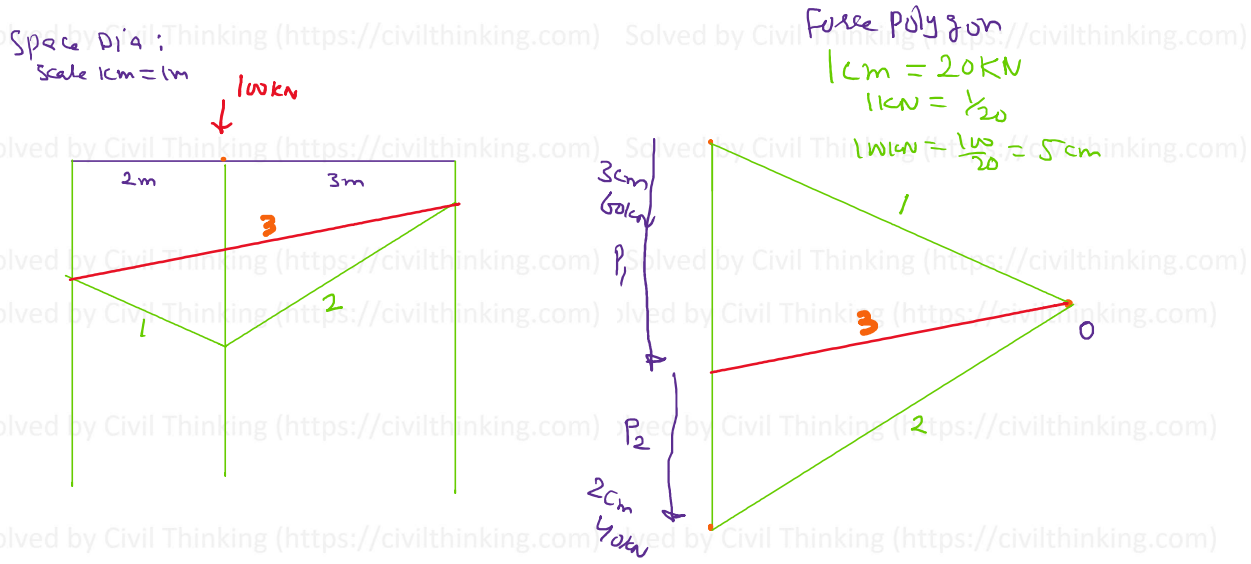
$\Rightarrow P_a =$ 300/5=60kN

cross check: Σ comp. = Resultant [Parallel force system]

$100 = 40 + 60$

$100 = 100$ ✓

Graphic Method:



Cross check: $P = P_1 + P_2$

$P = 100$

$P_1 + P_2 = 40 + 60 = 100$

$100 = 100$ ✓

☑ Construction Management ☑ Finite Element Analysis (FEA) ☑ Engineering Software (ANSYS WORKBENCH, ETABS, STAAD.Pro, Staad Foundation Advanced (SFA) & MATLAB)	