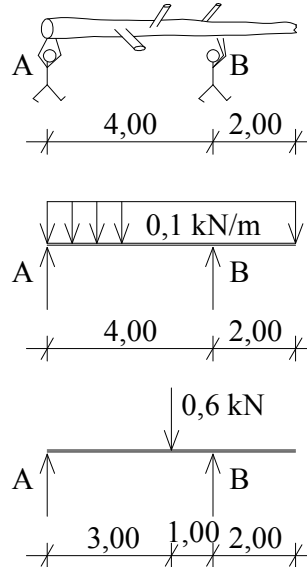


### Parallel and general force systems

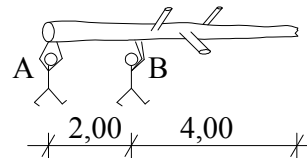
1)

The unit weight of the beam is 0,1 kN/m.  
 Make a drawing of the beam with all forces!  
 Which person feels that it is heavier?  
 How much weights are they carrying?



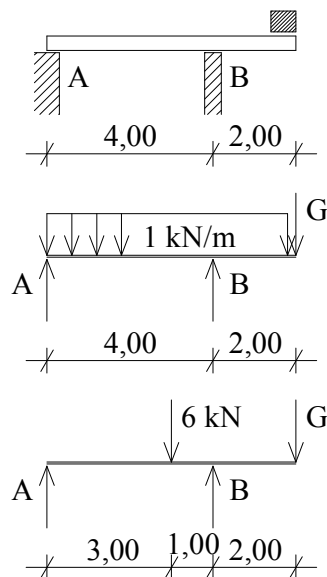
2)

What happens in this case?



3)

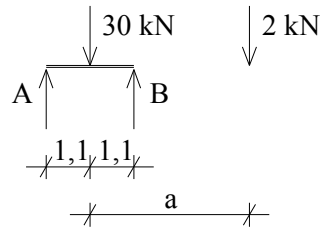
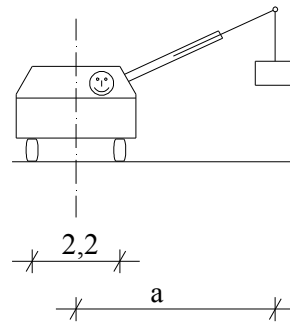
The unit weight of the beam is 1 kN/m. The weight of the box is G.  
 How much is the maximum of G, if the beam does not fall?  
 Make a drawing with all forces!  
 (G is maximal if A = 0. Beam falls if A < 0.)



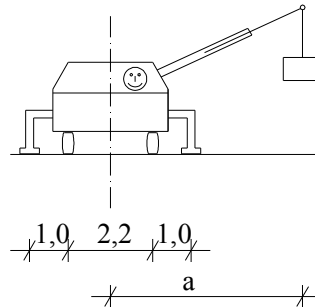
4)

$G_{\text{crane}} = 30 \text{ kN}$  (crane),  $G_{\text{box}} = 2 \text{ kN}$ .  
 What is  $a_{\text{max}}$

a) without supports?

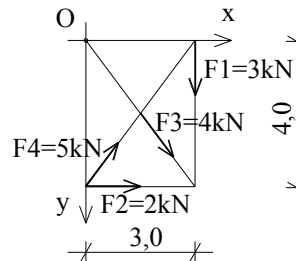


b) with supports?



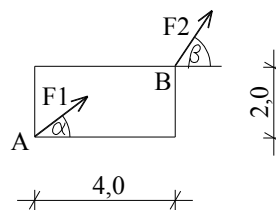
5)

Determine the moments of the forces about O !



6)

$F_1 = 4 \text{ kN}$  and the box is in equilibrium.  
 $F_2 = ?$ ,  $\alpha = ?$ ,  $\beta = ?$ .



7)

$F_1 = ?$ ,  $F_2 = ?$ ,  $\alpha = ?$  if the box is in equilibrium?

Hint: calculate  $F_1$ ,  $F_{2x}$ ,  $F_{2y}$  and then determine  $F_2$  and  $\alpha$  from  $F_{2x}$  and  $F_{2y}$  !

