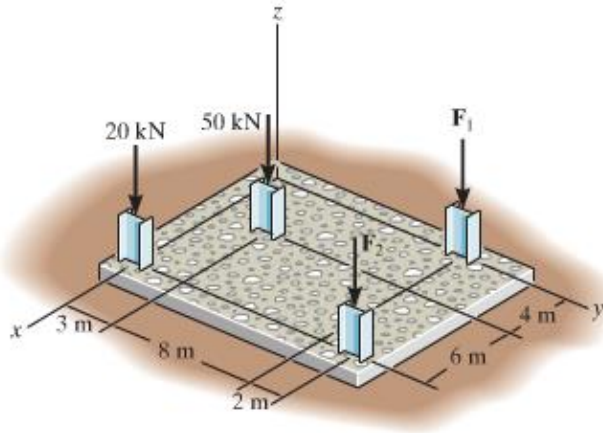


R4-7. The building slab is subjected to four parallel column loadings. Determine the equivalent resultant force and specify its location (x, y) on the slab. Take $F_1 = 30$ kN, $F_2 = 40$ kN.

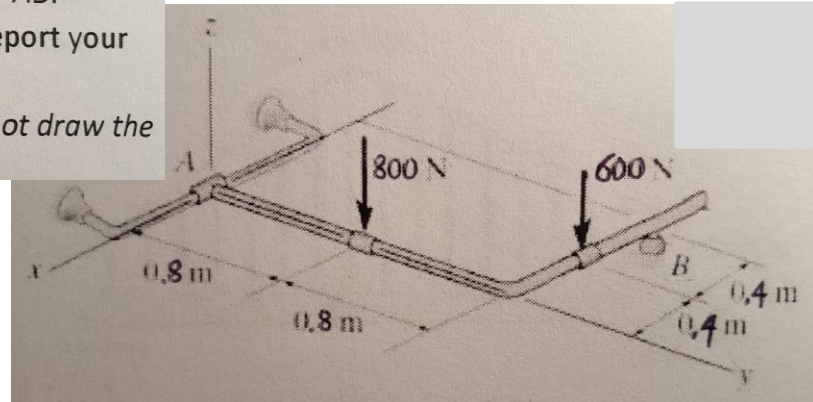


2. The weightless pipe assembly is supported in the horizontal plane by a smooth collar at A and rests on a smooth surface support at B . Two vertical forces are applied as shown.

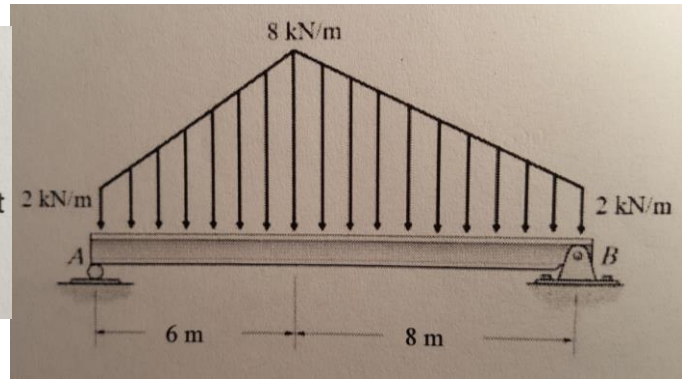
(a) Draw a free-body diagram of the pipe assembly AB .

(b) Determine the support reactions at A and B . Report your answers in Cartesian vector form.

You will receive no credit for part (b) if you do not draw the free-body diagram.



3. The distributed load acts on the beam AB as shown.
- Determine the force-couple system at point A that is equivalent to the original distributed load.
 - Replace the original distributed load with an equivalent resultant force, and specify its location measured from point A .



A force P is applied to the handle of the toggle clamp, resulting in a clamping force F at point C . The system is in equilibrium for the orientation shown. Neglect weight.

- (a) Draw a free-body diagram of the handle.
- (b) Draw a free-body diagram of the shaft CB , which slides freely in its smooth guide.
- (c) Draw a free-body diagram of link AB .
- (d) Determine the magnitudes of forces P and F .
- (e) Determine the magnitude of the pin force at O .

You will receive no credit for parts (d) and (e) if you do not draw the free-body diagrams.

