

CONCEPT CHECK

1. What does FBD mean?

- a. Free Board Design
c. Final Big Diagram

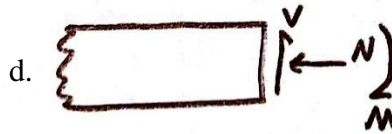
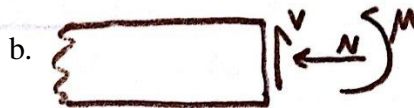
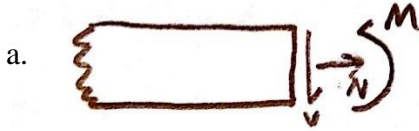
- b. Free Body Diagram
d. For Big Dimensions

2. For an object to be in static equilibrium, what must be true? (circle all that apply)

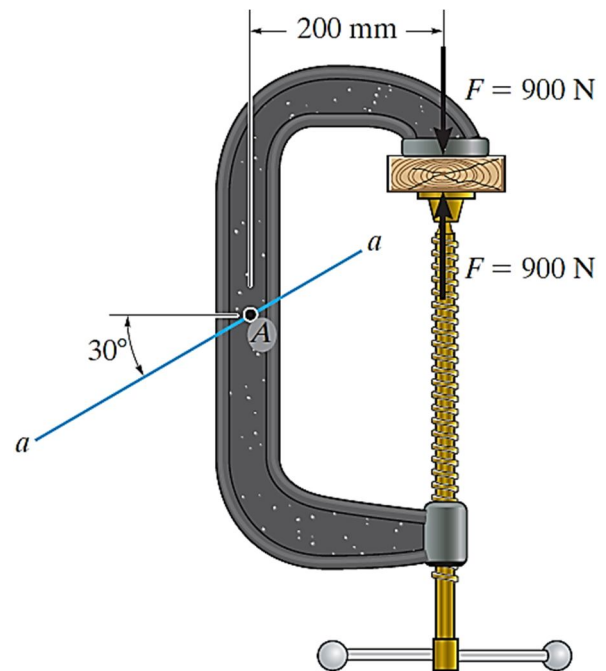
- a. $\sum F_x=0$
c. $ECL=0$

- b. $\sum F_y=0$
d. $\sum M=0$

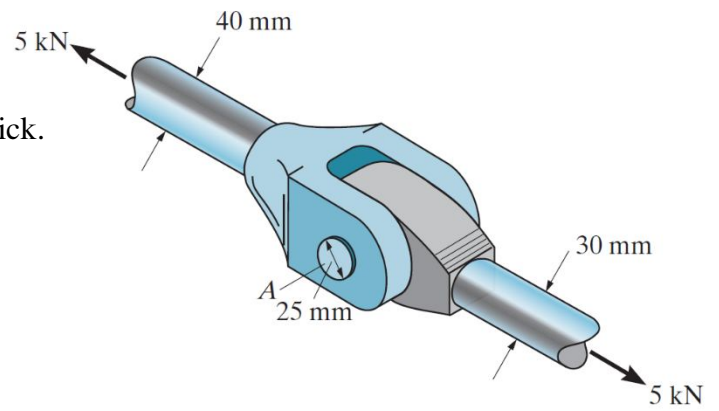
3. Which is the correct internal load sign convention?

**CALCULATION PROBLEMS**

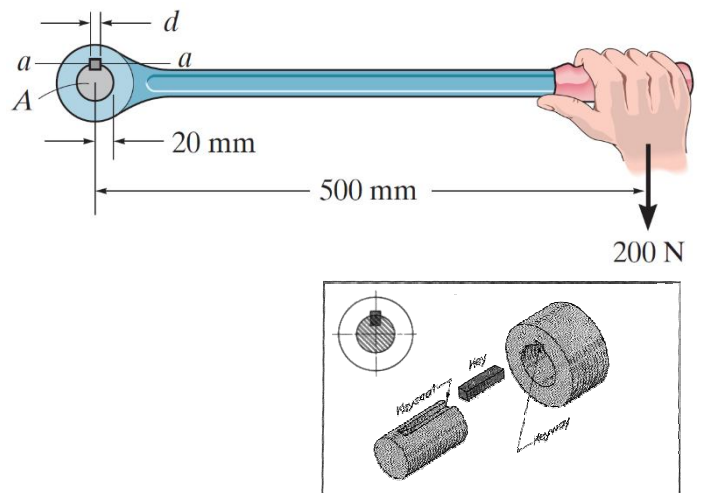
- 1) GIVEN: C-clamp loaded as shown.
REQ'D: Internal loads at $a-a$.



- 2) GIVEN: Yoke-and-rod connection.
 REQ'D: a) Average normal stress in each rod.
 b) Average shear stress in pin.
 c) Bearing stress if the yoke leaves are 20mm thick.



- 3) GIVEN: Lever attached to shaft A with 25mm long key.
 REQ'D: Minimum key width d if $\tau_{\text{allow}} = 35 \text{ MPa}$.



- 4) GIVEN: Rope swivel constructed as shown. $F = 500 \text{ lb}$
 REQ'D: Shear stress in washer if it is 1/16 in thick.

