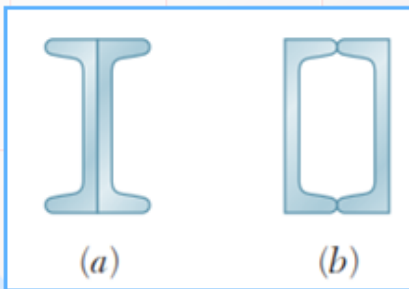
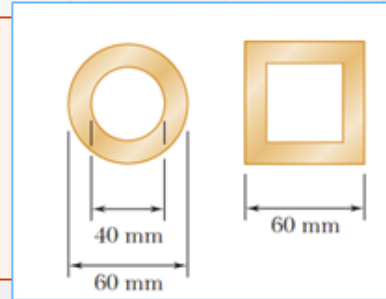


## 2. CÔNG THỨC EULER XÁC ĐỊNH LỰC TỚI HẠN (DITERMINE THE CRITICAL LOAD BY EULER'S FORMULA)

### Problem 1:

Two brass rods used as compression members, each of 3-m effective length, have the cross sections shown. (a) Determine the wall thickness of the hollow square rod for which the rods have the same cross-sectional area. (b) Using  $E = 105 \text{ GPa}$ , determine the critical load of each rod.



### Problem 2:

A column of 3-m effective length is to be made by welding together two C130x13 rolled-steel channels. Using  $E = 200 \text{ GPa}$ , determine for each arrangement shown the allowable centric load if a factor of safety of 2.4 is required.

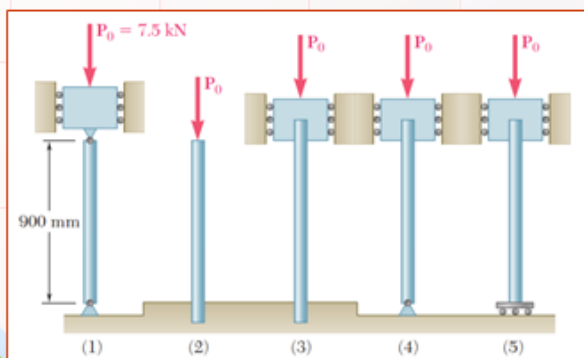
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## 2. CÔNG THỨC EULER XÁC ĐỊNH LỰC TỚI HẠN (DITERMINE THE CRITICAL LOAD BY EULER'S FORMULA)

### Problem 3:

A 2-m-long pin-ended column of square cross section is to be made of wood. Assuming  $E = 13 \text{ GPa}$ ,  $[\sigma] = 12 \text{ MPa}$ , and using a factor of safety of 2.5 in computing Euler's critical load for buckling, determine the size of the cross section if the column is to safely support (a) a 100-kN load, (b) a 200-kN load.



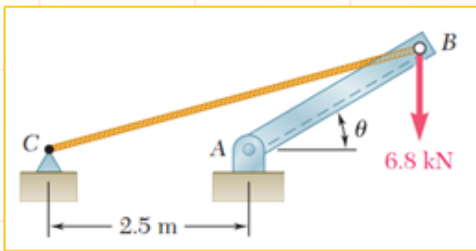
### Problem 4:

Each of the five struts shown consists of a solid steel rod. (a) Knowing that the strut of Fig. (1) is of a 20-mm diameter, determine the factor of safety with respect to buckling for the loading shown. (b) Determine the diameter of each of the other struts for which the factor of safety is the same as the factor of safety obtained in part a. Use  $E = 200 \text{ GPa}$ .

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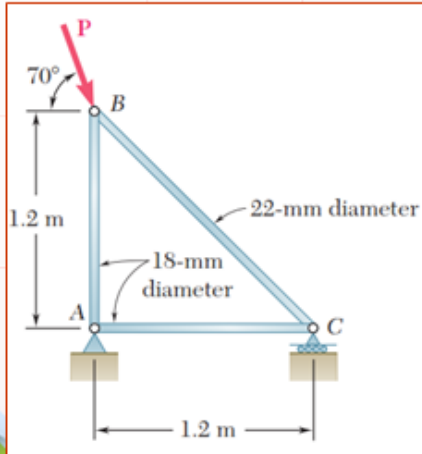
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## 2. CÔNG THỨC EULER XÁC ĐỊNH LỰC TỚI HẠN (DITERMINE THE CRITICAL LOAD BY EULER'S FORMULA)



### Problem 5:

Member AB consists of a single C130x10.4 steel channel of length 2.5 m. Knowing that the pins A and B pass through the centroid of the cross section of the channel, determine the factor of safety for the load shown with respect to buckling in the plane of the figure when  $\theta = 30^\circ$ . Use  $E = 200 \text{ GPa}$ .



### Problem 6:

Knowing that  $P = 5.2 \text{ kN}$ , determine the factor of safety for the structure shown. Use  $E = 200 \text{ GPa}$  and consider only buckling in the plane of the structure.

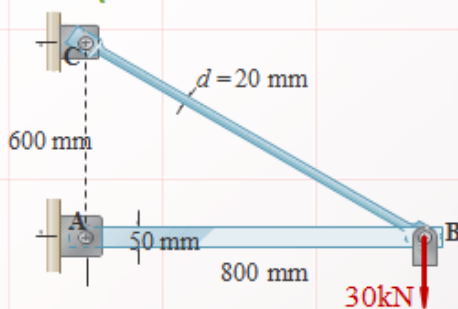
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## 5. PHƯƠNG PHÁP THỰC HÀNH TÍNH ỔN ĐỊNH.

(PRACTICAL METHODS DETERMINING STABILITY)

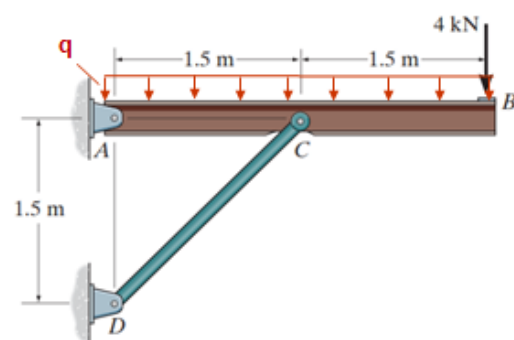


### Bài tập 8:

Cho hệ chịu lực như hình vẽ. Kiểm tra thanh vuông AB có ổn định không khi vật liệu làm thanh AB là thép CT3 có ứng suất cho phép  $[\sigma] = 20 \text{ kN/cm}^2$ , cạnh của AB là  $D = 50 \text{ mm}$ .

### Bài tập 9:

Cho hệ chịu lực như hình vẽ. Xác định  $[q]$  để thanh tròn CD ổn định. Biết CD làm từ thép CT3 có đường kính  $d = 5 \text{ cm}$  và ứng suất cho phép  $[\sigma] = 20 \text{ kN/cm}^2$ .



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