

科目：工程力學

適用：土木系三

考生注意：

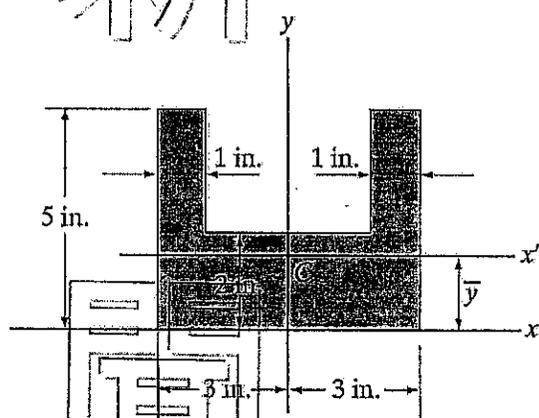
1. 依次序作答，只要標明題號，不必抄題。
2. 答案必須寫在答案卷上，否則不予計分。
3. 限用藍、黑色筆作答；試題須隨卷繳回。

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(1) For the cross section as shown below, determine:

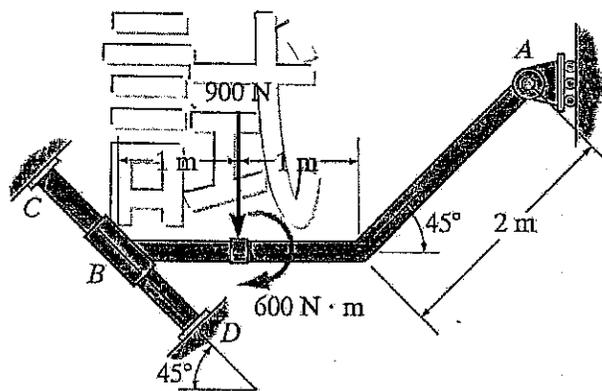
- (a) the centroidal  $\bar{y}$  of the composite area, (10%)
- (b) the moment of inertia about the  $x'$  centroidal axis. (10%)



(2) The collar is fixed to the rod  $AB$ , but is allowed to slide along rod  $CD$ ,

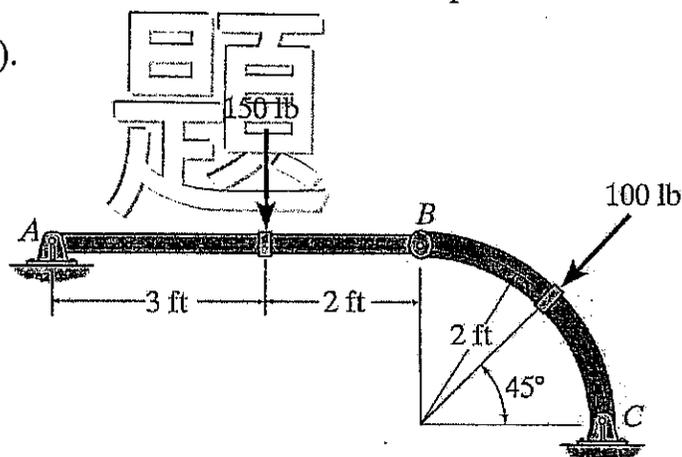
determine:

- (a) the support reactions of roller  $A$  (10%)
- (b) normal force and moment of the smooth collar  $B$  on the rod. (10%)



(3) Determine the horizontal and vertical components of reaction at pins  $A$

and  $C$  (20%).



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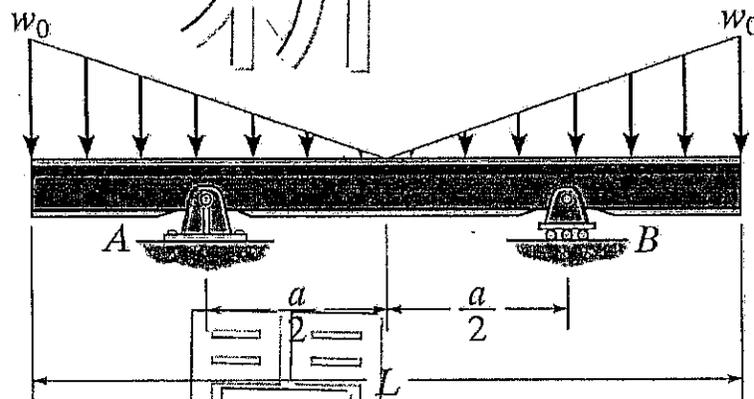
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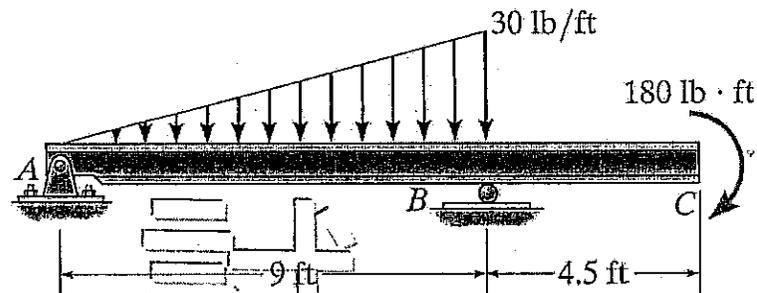
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- (4) Determine the distance  $a$  in terms of the beam's length  $L$  between the symmetrically placed supports  $A$  and  $B$  so that the internal moment at the center of the beam is zero. (20%)



- (5) Draw the shear and moment diagrams for the beam. (20%)



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