

**CIV100F – MECHANICS ONLINE**

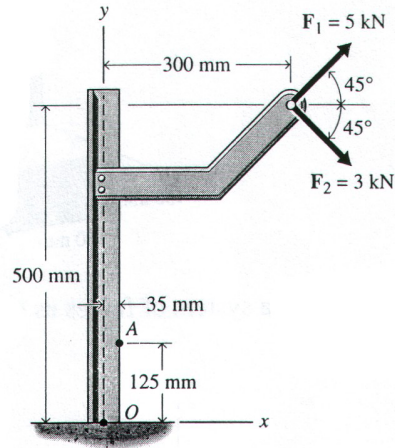
**Assignment No. 2**

Due: As indicated in Quercus

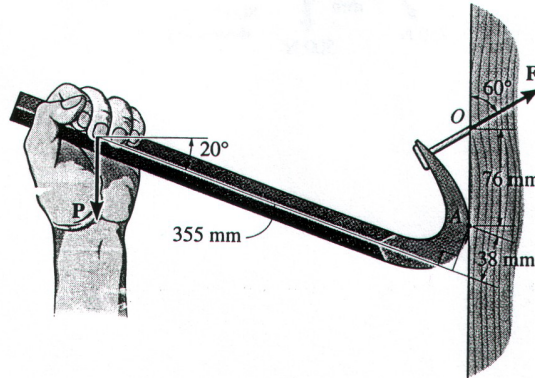
Material Covered: Textbook – Chapter 4

1. Two forces,  $\vec{F}_1$  and  $\vec{F}_2$ , are applied to a bracket as shown. Determine:

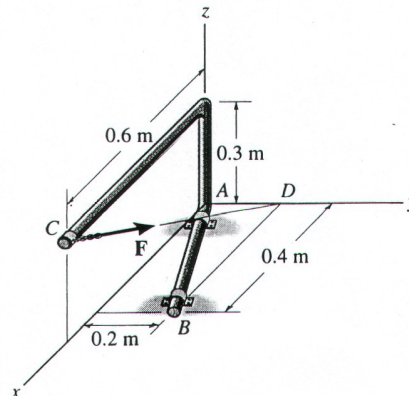
- (a) The moment of force  $\vec{F}_1$  about point  $O$ ; and  
 (b) The moment of force  $\vec{F}_2$  about point  $A$ .



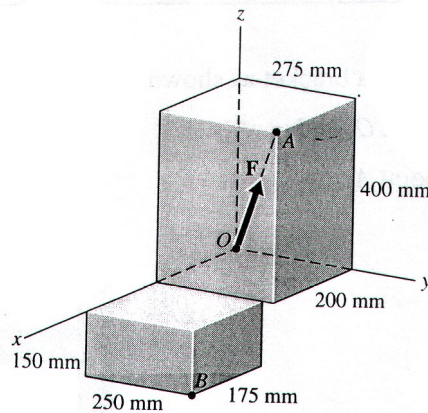
2. The crowbar is subjected to a vertical force  $P = 110 \text{ N}$  at the grip, whereas it takes a force of  $F = 690 \text{ N}$  at the claw to pull the nail out. Find the moment of each force about point  $A$  and determine if  $\vec{P}$  is sufficient to pull out the nail. The crowbar contacts the board at point  $A$ .



3. The rod is supported by two brackets at  $A$  and  $B$ . Determine the moment  $M_{AB}$  produced by  $\vec{F} = -600\vec{i} + 200\vec{j} - 300\vec{k} \text{ N}$ , which tends to rotate the rod about the  $AB$  axis.



4. A force  $\vec{F}$  of magnitude 840 N acts at a point as shown. Determine:
- The moment of the force about point  $B$ ;
  - The direction associated with the unit vector  $\vec{\lambda}$  along the axis of the moment; and
  - The perpendicular distance  $d$  from point  $B$  to the line of action of the force.



5. A beam is loaded with a system of forces as shown. Express the resultant of the force system in Cartesian vector format.

