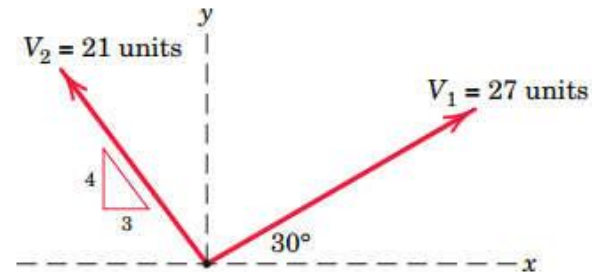


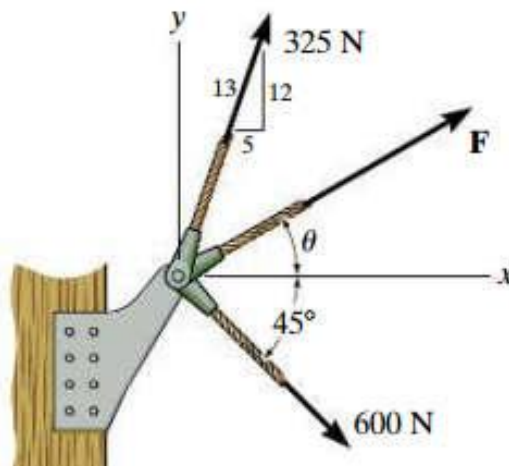
Engineering Mechanics-I: Statics (CEng2061) Work Sheet-I

1. For the vector, find

- Vector sum magnitude(V)
- Angle between V and positive x - axis
- Unit vector along the resultant
- Vector difference $D = V_1 - V_2$

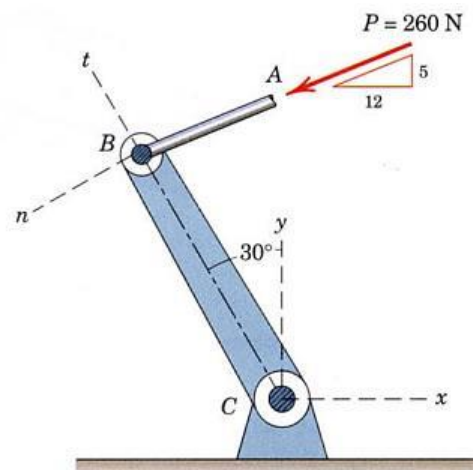


2. If the resultant force acting on the bracket is to be 750 N directed along the positive x -axis, determine the magnitude of F and its direction



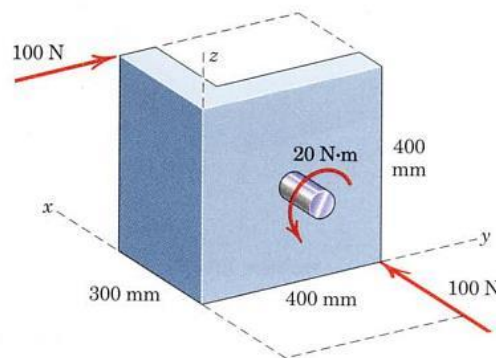
3. In the design of a control mechanism, it is determined that rod AB transmits a 260N force P to the crank BC. Determine

- the x and y component of force P
- the n and t component of force P

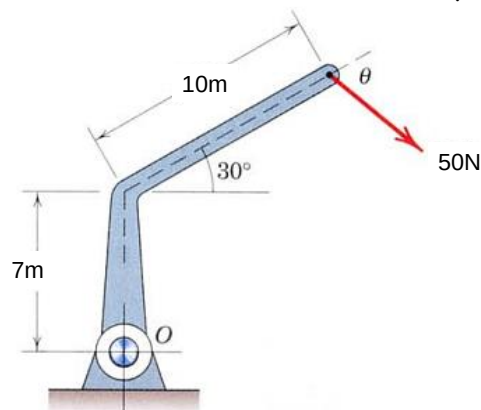


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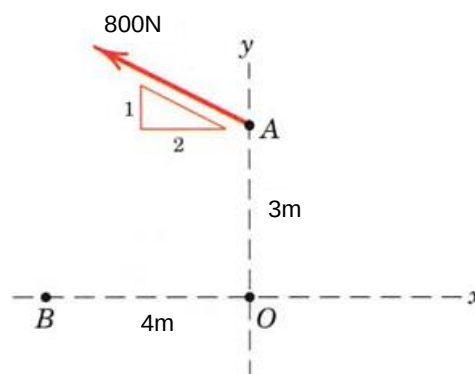
4. The resultant of the two forces and couple may be represented by a wrench. Determine the vector expression for the moment M of the wrench and find the coordinates of the point P in the x - z plane through which the resultant force of wrench passes.



5. Calculate the moment of the 50-N force about point O for the condition $\theta = 20^\circ$. Also, determine the value of θ for which the moment about point O is
- Zero
 - Maximum

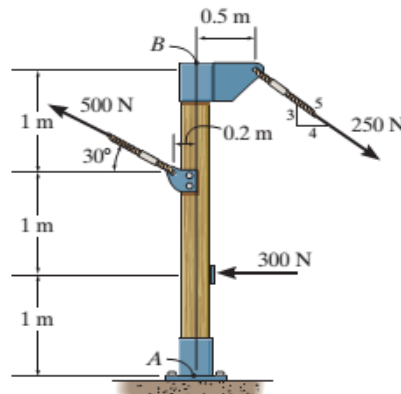


6. Replace the 800 N force acting at point A by a force-couple system at
- Point O
 - Point B

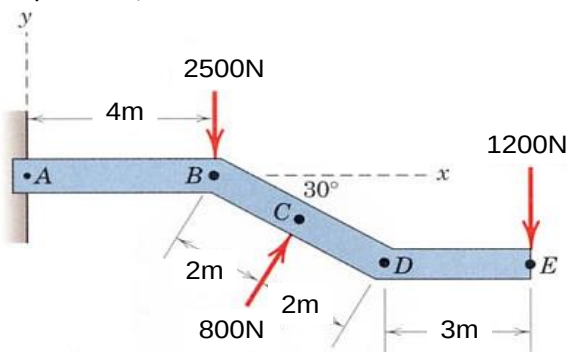


Engineering Mechanics-I: Statics (CEng2061) Work Sheet-I

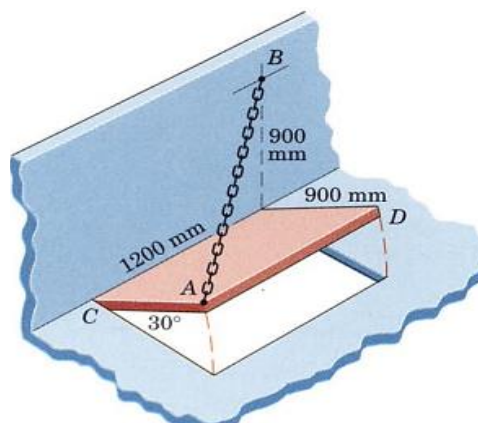
7. Replace the force system acting on the post by a resultant force, and specify where its line of action intersects the post AB measured from point B.



8. Replace the three forces which act on the bent bar by a force-couple system at the support point A. then determine the x-intercept of the line of action of the stand-alone resultant force R.

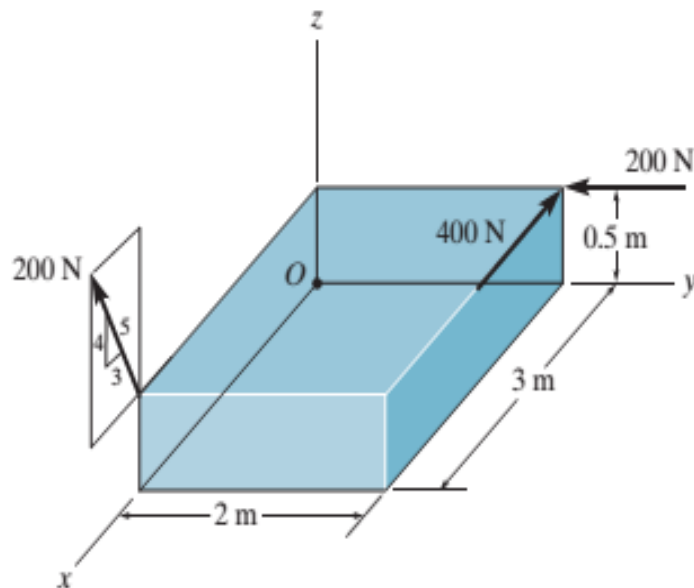


9. The access door is held in the 30° open position by the chain AB. If the tension force F in the chain acting on B is 100N,
- Determine the unit vector and coordinate direction angles of F .
 - Determine the projection of the tension force F onto the diagonal axis CD of the door

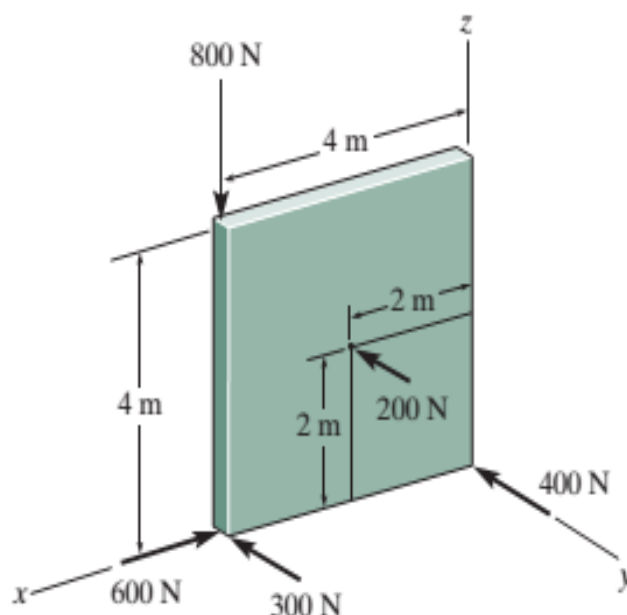


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10. Replace the force system by a wrench and specify the magnitude of the force and couple moment of the wrench and the point where the wrench intersects the x-z plane.

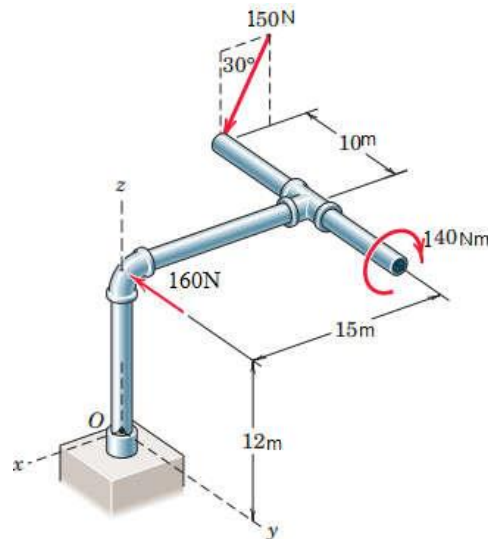


11. Replace the five forces acting on the plate by a wrench. Specify the magnitude of the force and couple moment for the wrench and the point $P(x, z)$ where the wrench intersects the x-z plane.

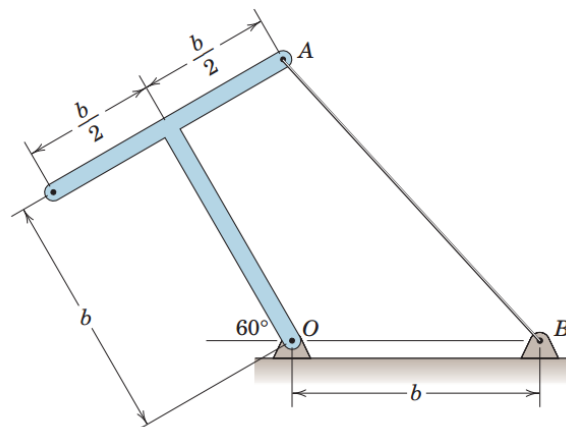


Engineering Mechanics-I: Statics (CEng2061) Work Sheet-I

12. Replace the two forces and one couple acting on the rigid pipe frame by their equivalent resultant force $\mathbf{R}$ acting at point O and a couple $\mathbf{M}_O$

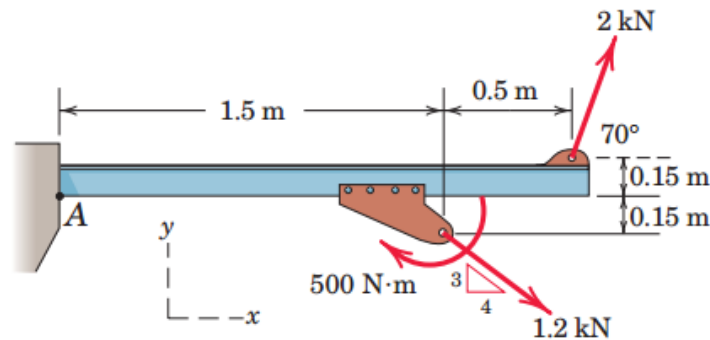


13. The tension in cable AB is 100 N. Determine the moment about O of this tension as applied to point A of the T-shaped bar. The dimension b is 600 mm.

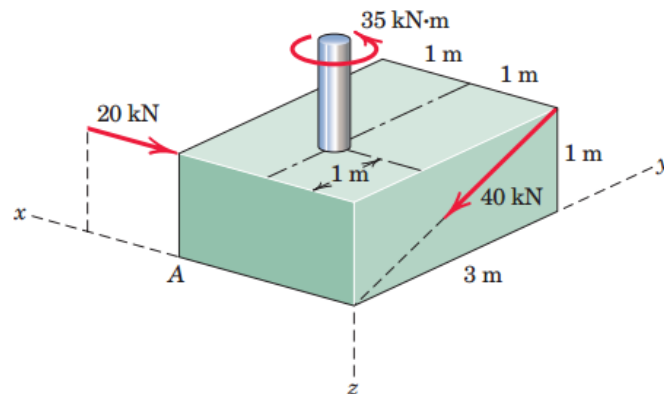


14. The flanged steel cantilever beam with riveted bracket is subjected to the couple and two forces shown, and their effect on the design of the attachment at A must be determined. Replace the two forces and couple by an equivalent couple M and resultant force R at point A.

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15. Replace the two forces and single couple by an equivalent force-couple system at point A.



16. Convert the given force system on a cube shown below in to a wrench resultant and determine the co-ordinate points in each plane that the resultant forms so as to have the same effect on the system

