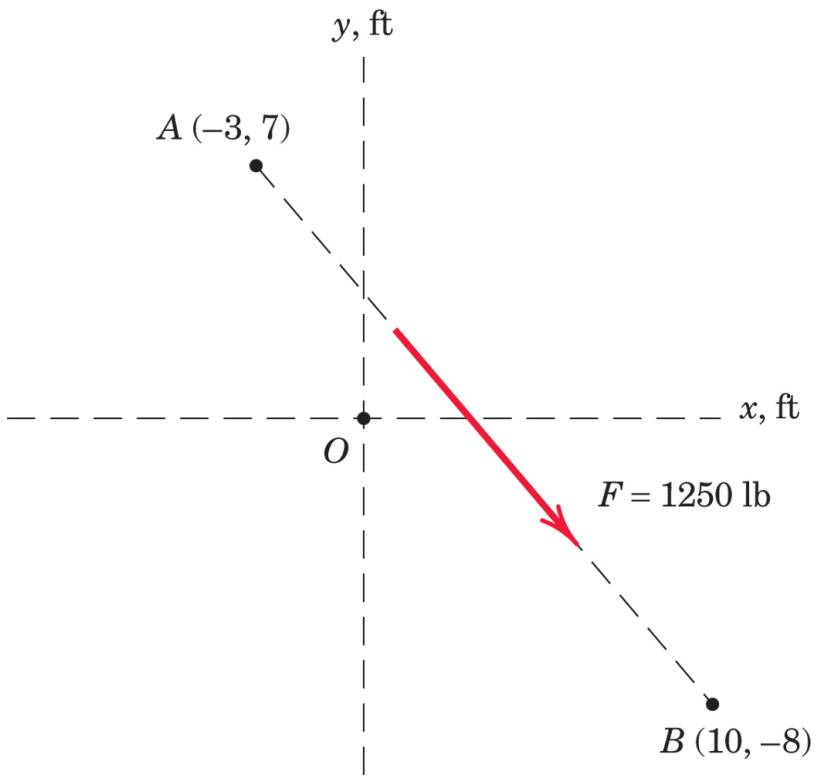
ENGG 202
Jan 16 Week 2

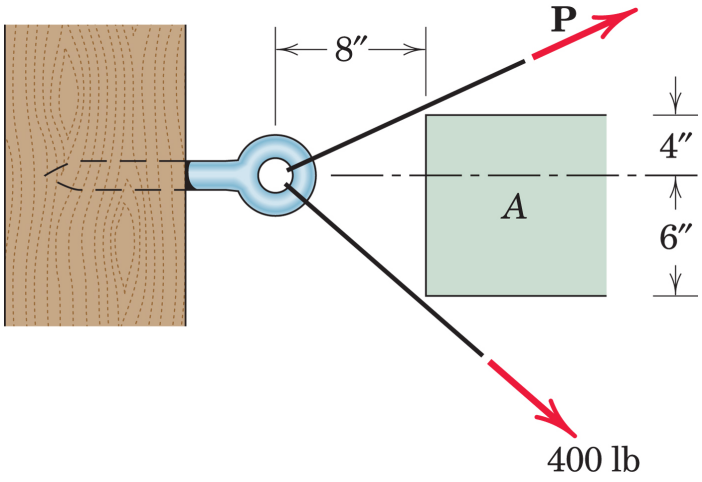
Problems



Problem 2/4

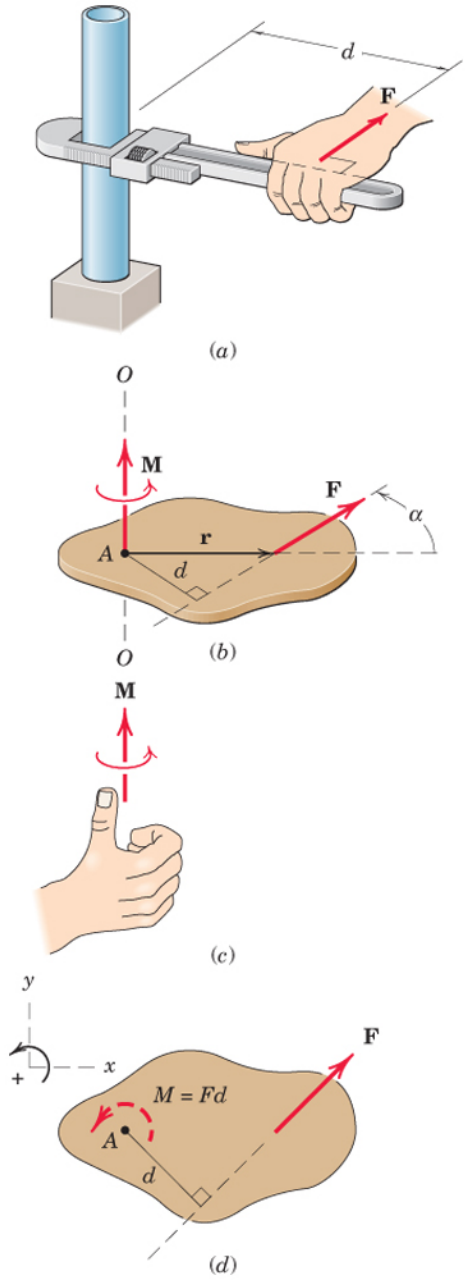
Problem 2/26

Compute the magnitude of **P** necessary to ensure a resultant **T** directed along the spike. Also find **T**.



2/4 MOMENT

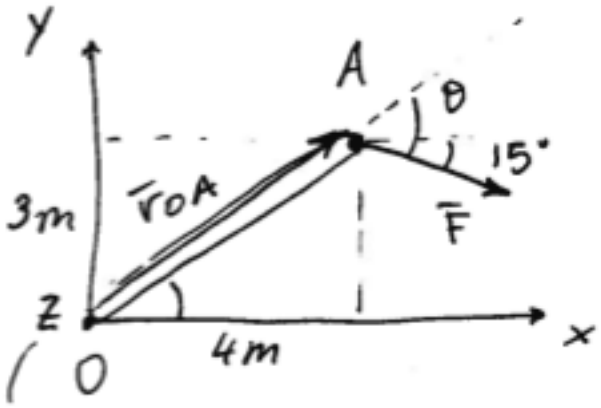
In addition to the tendency to move a body in the direction of its application, a force can also tend to rotate a body about an axis.
A **moment** of a force about a point is a **vector** that is directed along the axis perpendicular to the plane defined by the **force** and the **position vector** (from the point where the moment is computed to the point of application of the force).



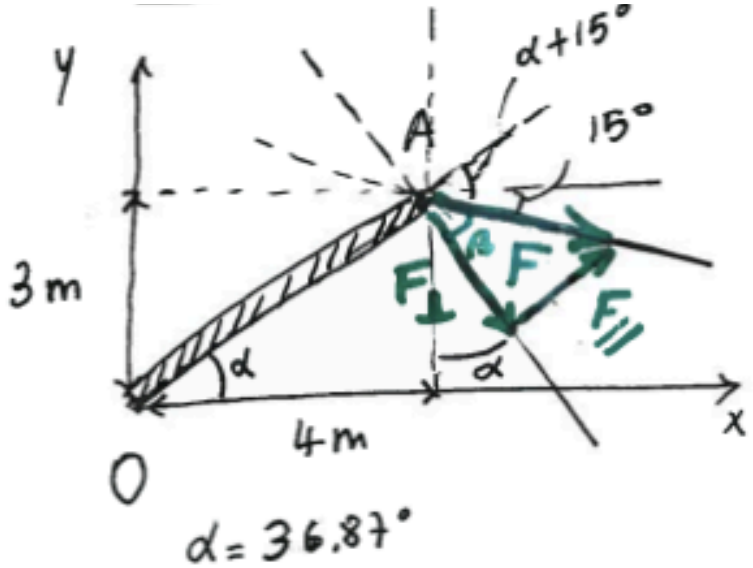
Varignon's Theorem

The moment of a force about any point is equal to the sum of the moments of the components of the force about the same point.

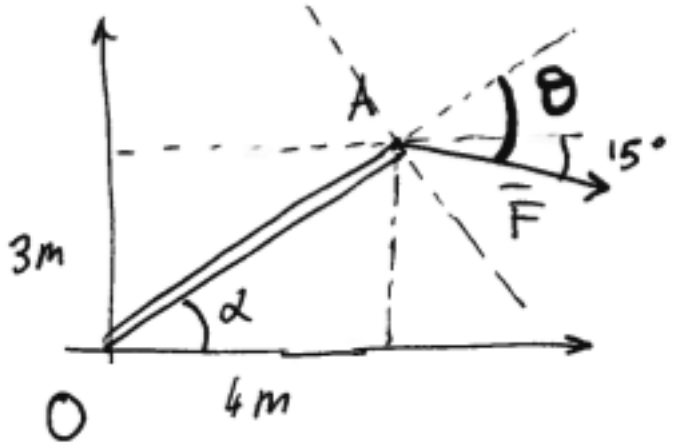
Question: Compute the moment about 0 of the force **F**



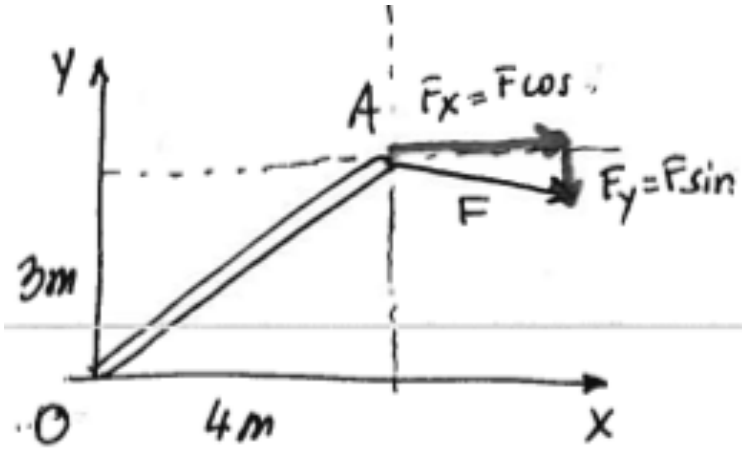
Method #1 **IN 2D**



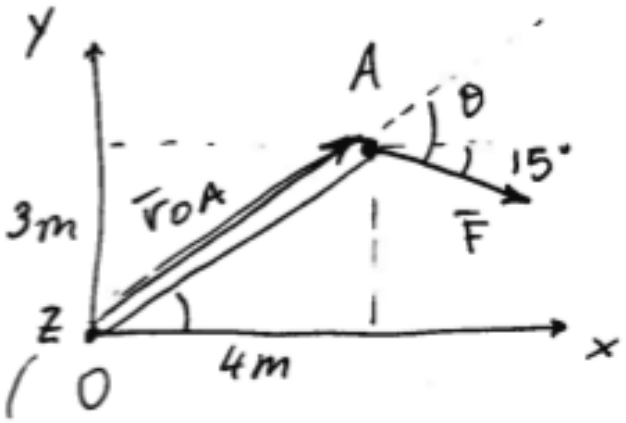
Method #2 **IN 2D**



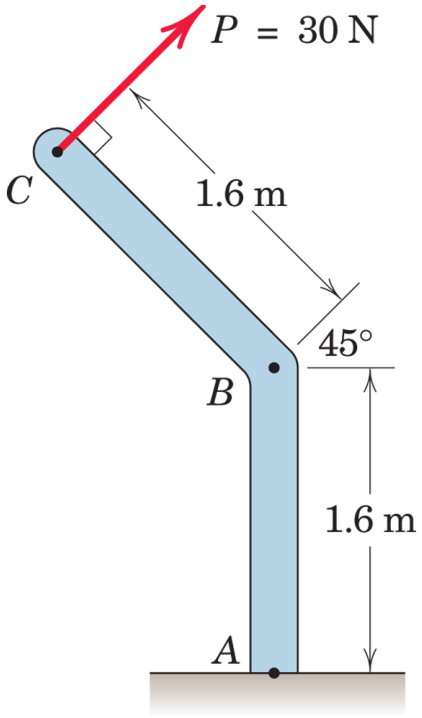
Method #3 **IN 2D**



Method #4 **IN 3D and IN 2D – VECTOR PRODUCT**

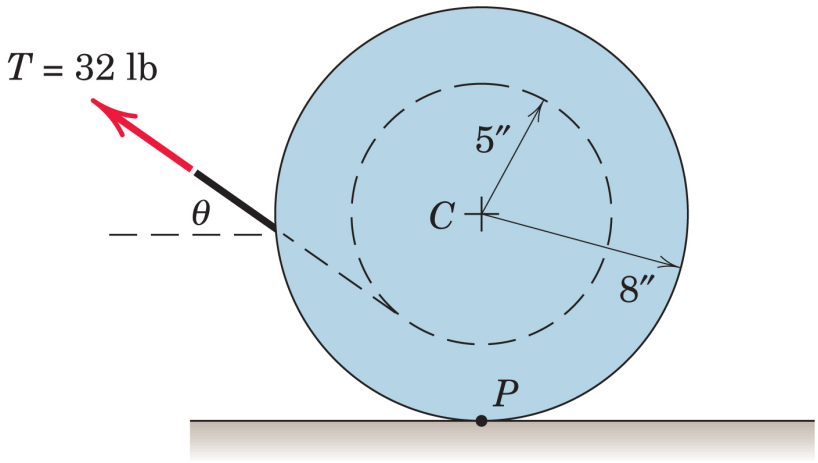


Problem 2/39
The 30N force **P** is applied perpendicular to the portion BC of the bent bar.
Determine the moment of **P** about point A.



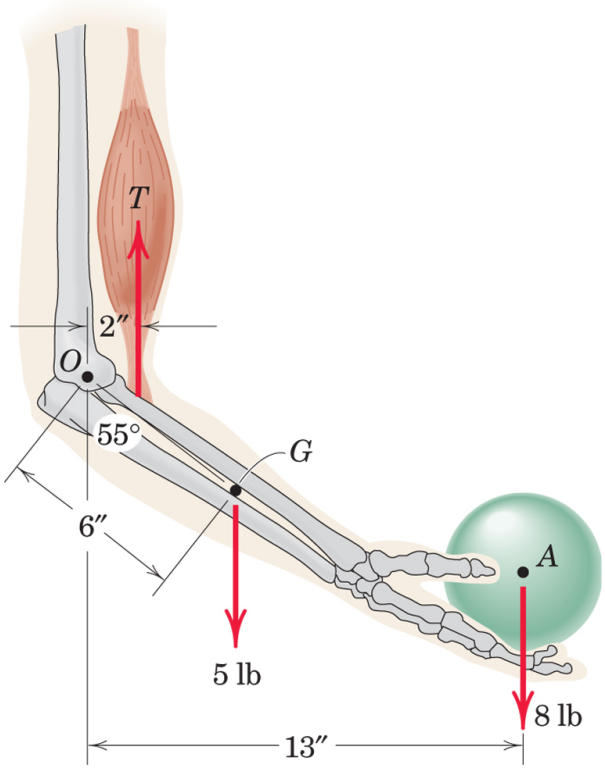
Problem 2/41

A 32 lb pull **T** is applied to a cord, which is wound securely around the inner hub of the drum. Determine the moment of **T** about the drum center C. At what angle **θ** should **T** be applied so that the moment about the contact point P is zero?



Problem 2/50

Elements of the lower arm are shown in the figure. The weight of the forearm is 5 lb with center of gravity G. Determine the combined moment about the elbow pivot O of the weight of the forearm and the sphere. What must be the biceps tension force **T** so that the overall moment about 0 is zero?



Problem 2/54

If **α** =30° calculate the moment of **F** about the center of the bolt O. Determine the value of **α** that would masimize the moment about O and determine the value of this maximum moment.