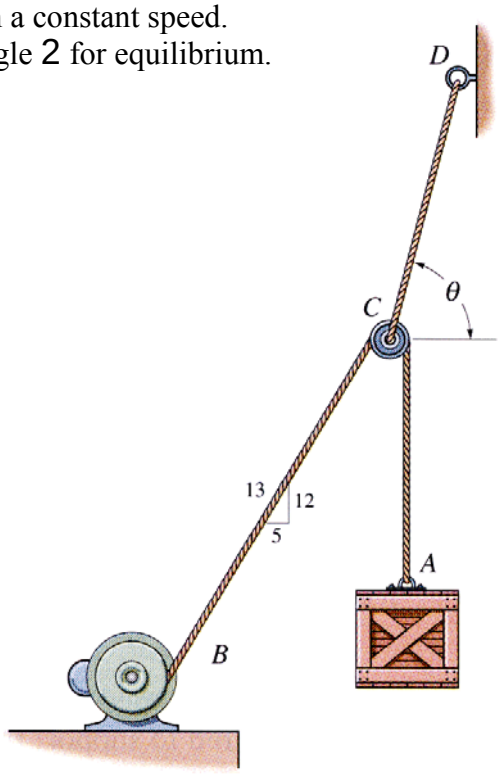
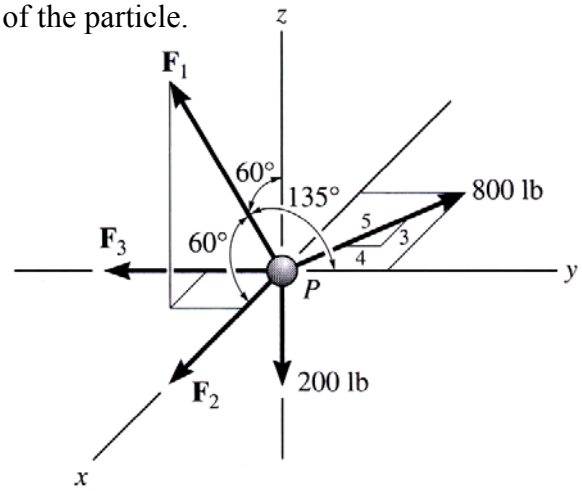
BE 50F - Fall 2001 - Test 1 **Name:** _____

1. The motor at *B* winds up the cord attached to the 65-lb crate with a constant speed. Determine the force in rope *CD* supporting the pulley and the angle θ for equilibrium. Neglect the size of the pulley at *C*.

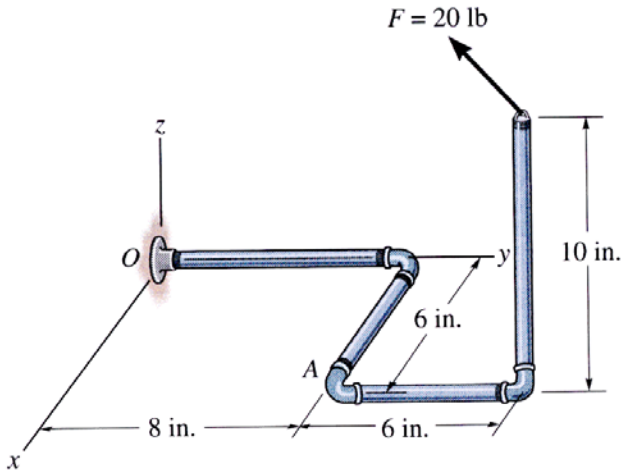


This relation may be helpful: $\tan\theta = \sin\theta / \cos\theta$

2. Determine the magnitudes of $\mathbf{F}_1$, $\mathbf{F}_2$, and $\mathbf{F}_3$ for equilibrium of the particle.



3. Determine the moment of the force F about point O. The force has coordinate direction angles of " = 60°, $ = 120°, (= 45°. Express the result as a Cartesian vector.



4. Replace the loading on the beam by an equivalent resultant force and specify its location, measured from point *A*.