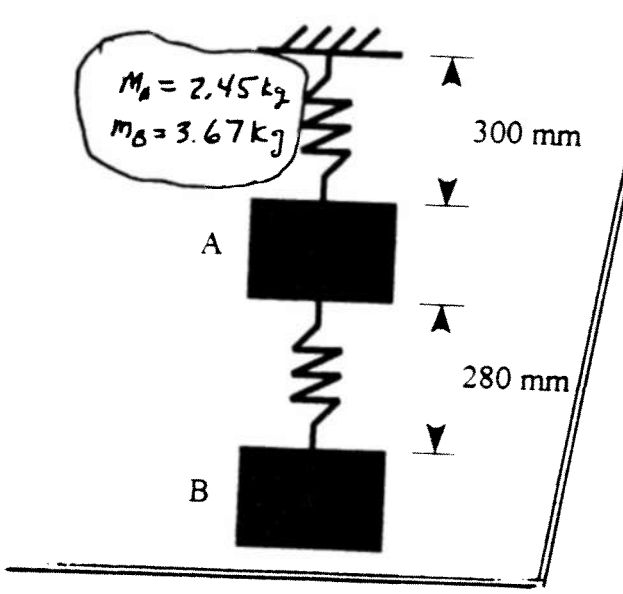
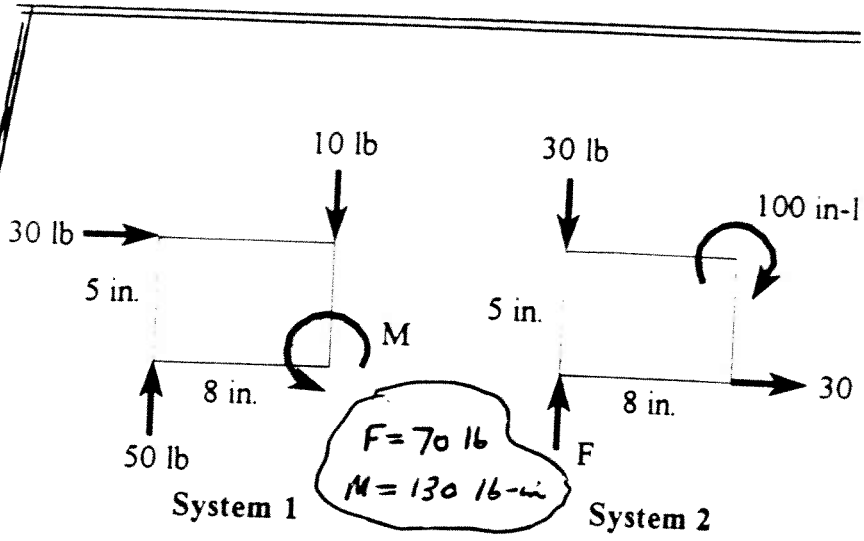
BE-50 WS97 Final Exam Dept. Average 69.9%

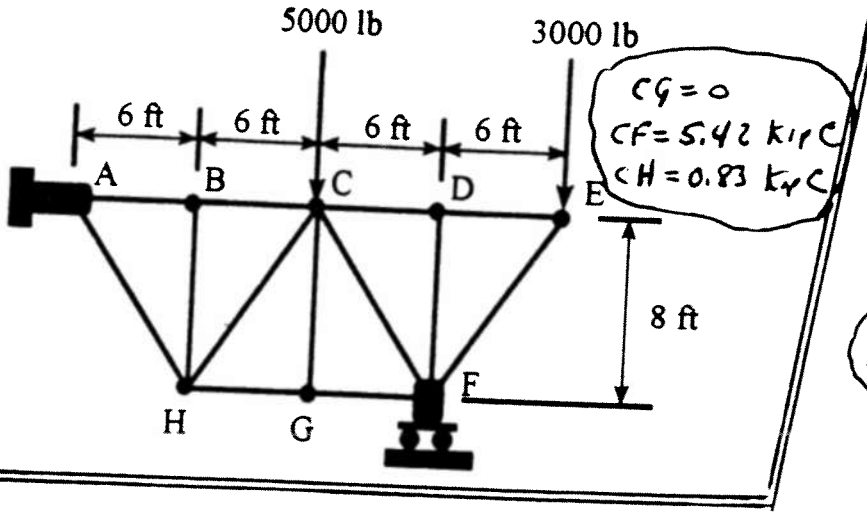
1. The two springs are identical, with unstretched lengths 250 mm and spring constants $k = 1200$ N/m. Carefully draw the complete free-body diagram of each block, and then determine the mass of each block.



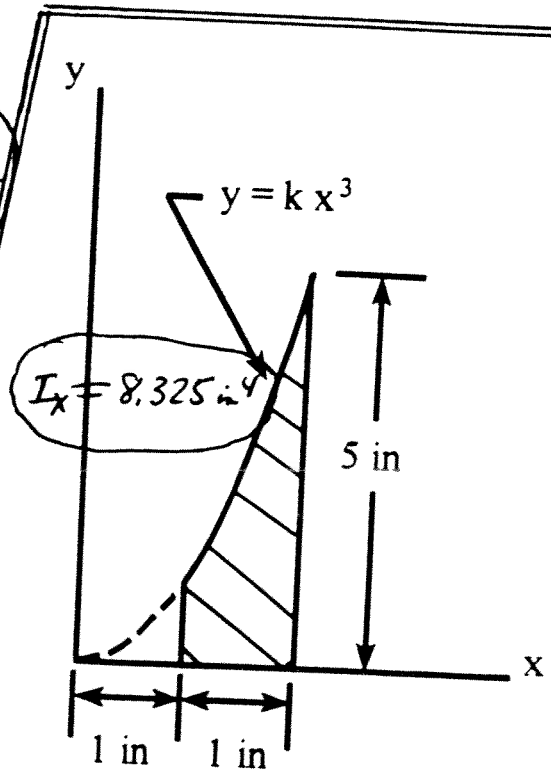


2. Two equivalent systems of forces and moments act on the plate. Determine the force F and the couple M.

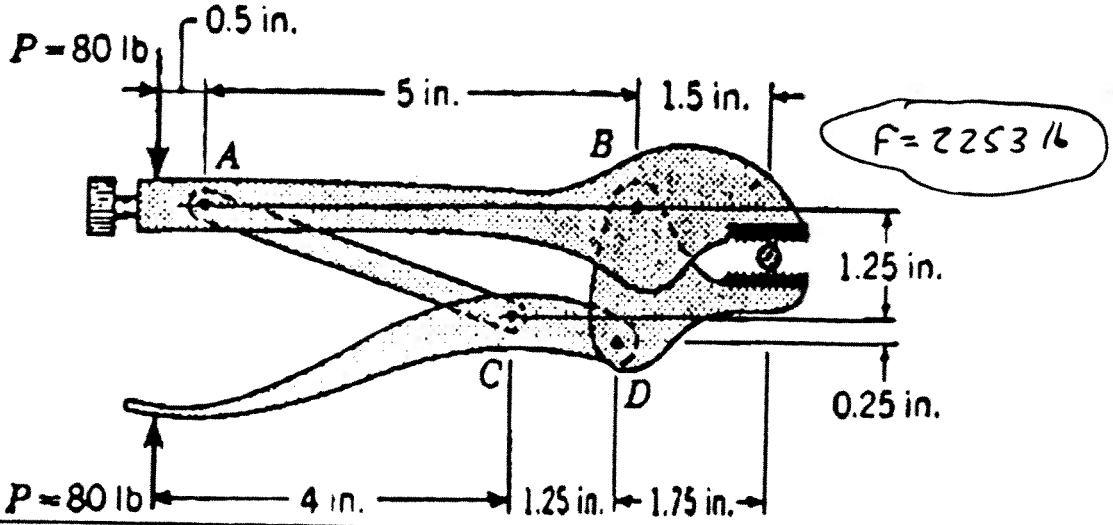
3. Determine the force in members CH, CG and CF of the truss loaded as shown. Be sure to indicate tension or compression.



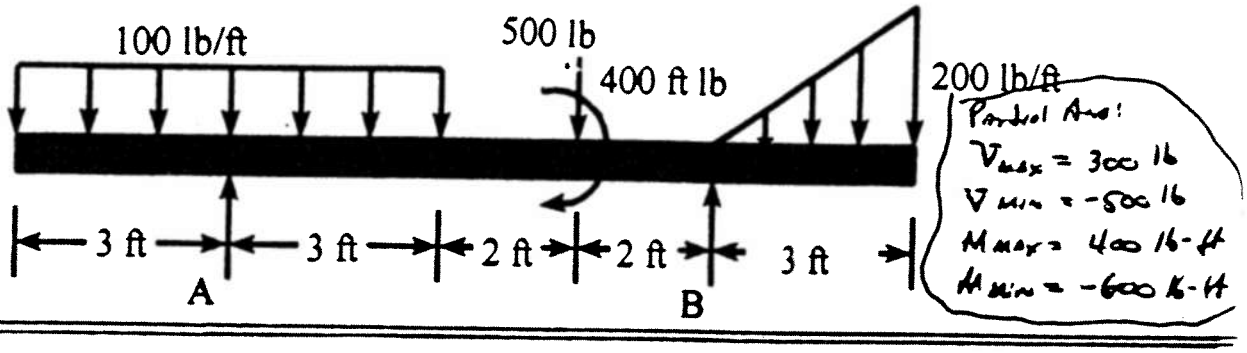
6. Determine the moment of inertia I_x for the shaded area shown. Please express your answer in numerical terms (not in 'k').



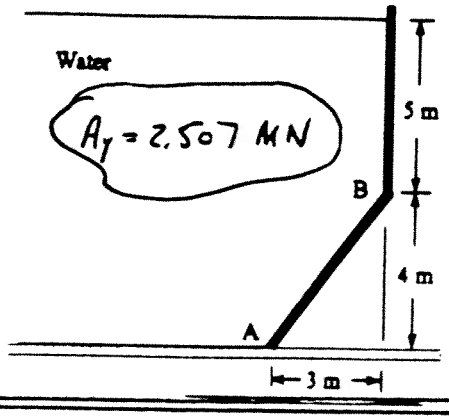
4. Determine the compressive forces exerted on the bolt as a result of the two forces P = 80 lb applied as shown.



5. Draw the shear force and bending moment diagrams for the beam loaded as shown. The reactions are A = 600 lb and B = 800 lb. Be sure to label all significant points and to indicate the power of any curves.



7. The gate AB is 8 m wide, is pinned along its top edge B and rests on the smooth horizontal support at A. Determine the reaction at A if the mass density of the water is ρ_w = 1.00 Mg/m^3.



8. Block A has a mass of 50 kg and rests on surface B for which μ_s = 0.25. If the coefficient of static friction between the cord and fixed peg at C is μ_s' = 0.30, determine the greatest mass the suspended cylinder D may have without causing motion.