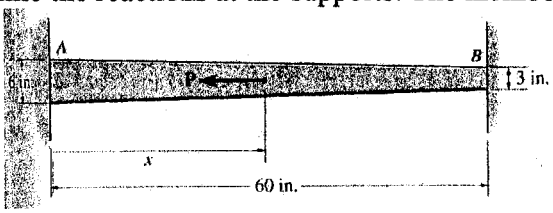
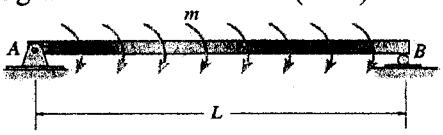
所別：機械工程學系碩士班 甲組(固力與設計) 科目：材料力學
戊組(生醫)

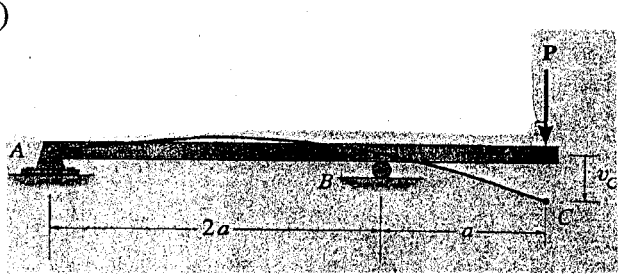
1. The tapered member is fixed connected at its ends *A* and *B* and is subjected to a load *P* at $x = 30$ in. Determine the reactions at the supports. The member is 2 in. thick. (25%)



2. The beam is subjected to the uniformly distributed moment *m* (moment/length). Draw the shear and moment diagrams for the beam. (25%)



3. The beam is subjected to a load *P* at its end. Determine the diaplacement at *C*. (*EI* is constant) (25%)



4. The shaft has a radius *r* and is subjected to the following loadings: an axial load, *P*, a bending load, $V = 3P$, and a torque, $T = Pr/4$. The length of the shaft *L* is ten times the radius, i.e., $L = 10r$. Determine the maximum tensile stress and the maximum shear stress that is developed anywhere on the surface of the shaft. Please show your final results in terms of *P* and *r*. In addition, show the corresponding location on the shaft for these stresses with a sketch of properly oriented elements in reference to the axial direction of the shaft. (25%)