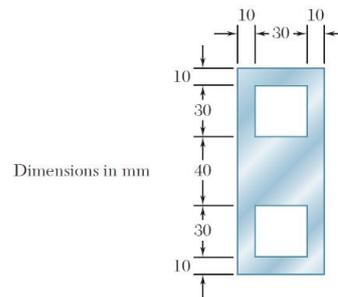
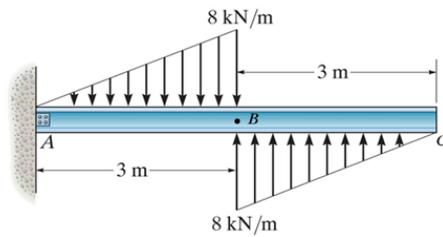


Exam 2
November 21, 2014
90 minutes

Problem 1 (40 Points)

For the cantilever beam having the cross-sectional area shown below:

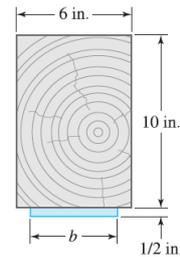
- a) Find the equations and draw the shear and moment diagrams
- b) Determine the values and locations of the maximum tensile and maximum compressive stresses.
- c) Determine the value and location of the maximum shear stress.



Problem 2 (20 Points)

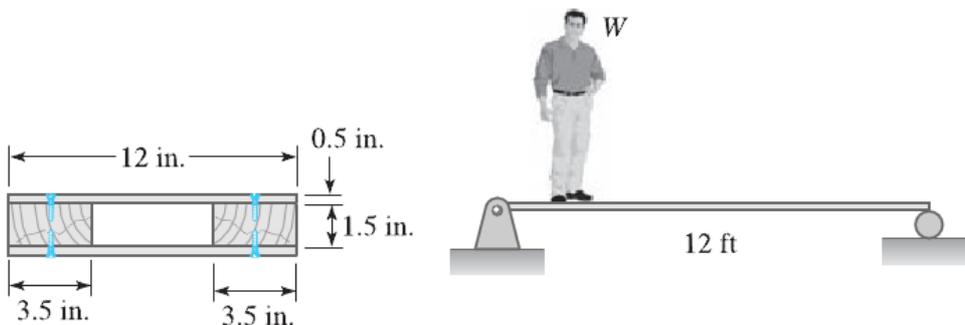
Determine the width b of the steel plate fastened to the bottom of the wood beam so that the allowable stresses of 1.2 Ksi for wood and 18 ksi for steel are reached simultaneously.

Use $\frac{E_{st}}{E_w} = 20$.



Problem 3 (20 Points)

The 12-ft-long walkway of a scaffold is made by screwing two 12-in. by 1/2-in. sheets of plywood to 1.5-in. by 3.5-in. timbers as shown. The screws have 5-in. spacing along the length of the walkway. The allowable stress in bending is $\sigma_w = 850\text{psi}$ for the plywood and the timbers, and the allowable force in each screw is 250 lb. What limit should be placed on the weight W of a person who walks across the plank?



Problem 4 (20 Points)

Determine the normal stress developed at points *A* and *B*. Neglect the weight of the block.

