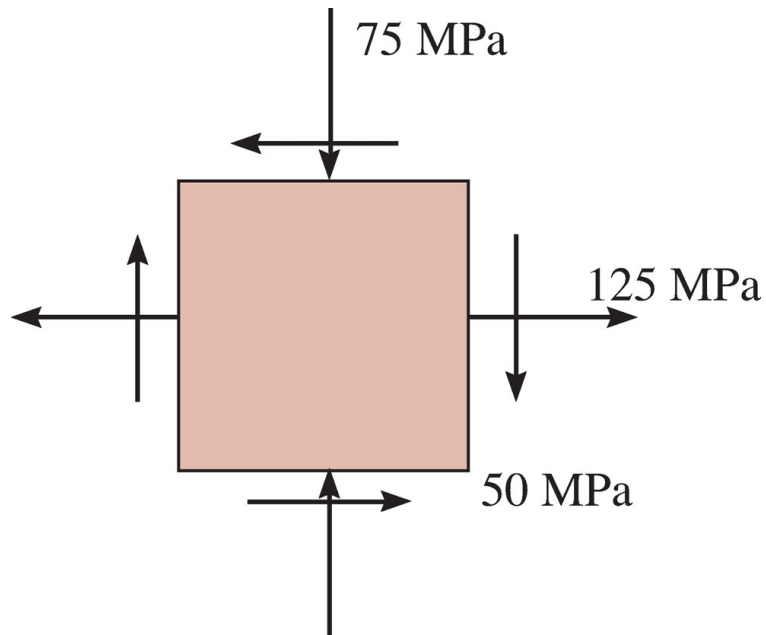


Name:

Homework 8

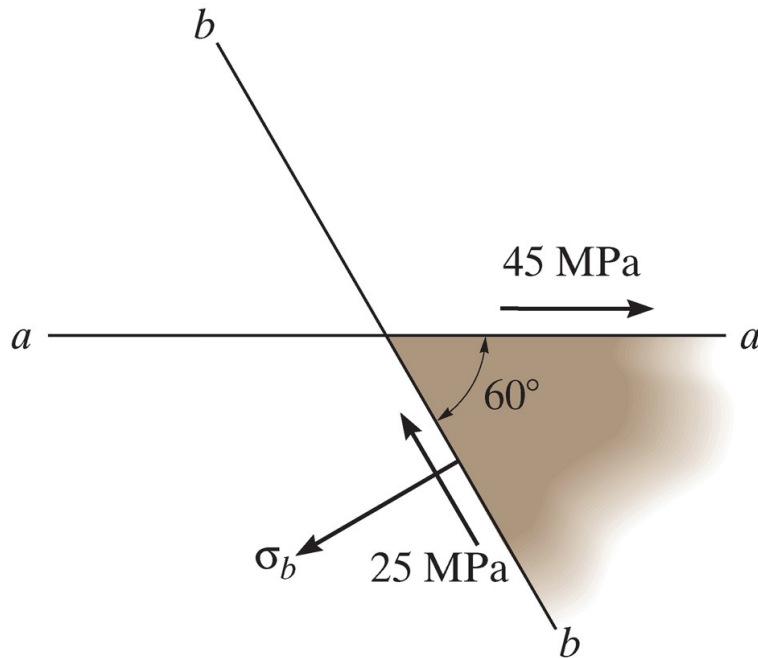
Due 23 April 2021

1. Find the stress state on an axis rotated 30° counter-clockwise from the x and y axis.

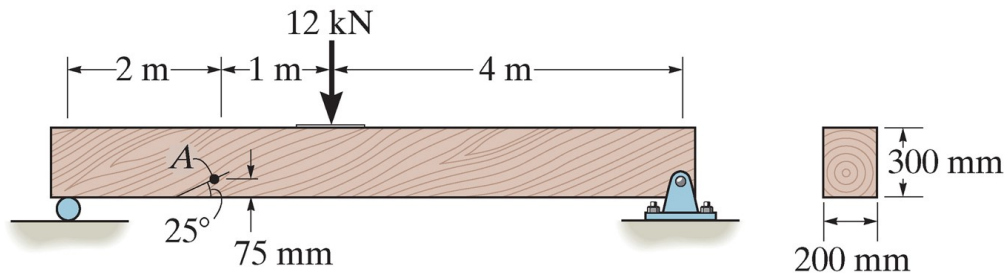


2. For the stress state in Problem 1, find the principal stresses and maximum (in-plane) shear stress

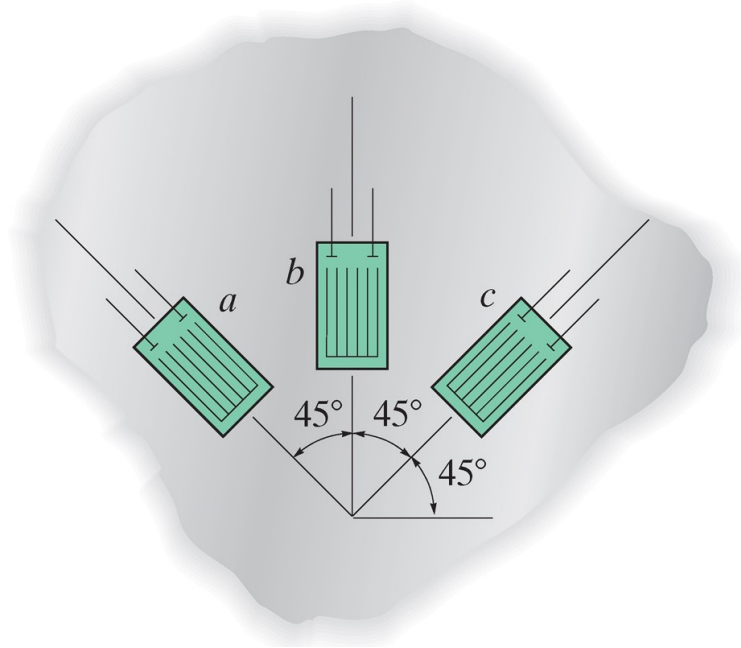
3. The stress state along two planes is known as shown. Find the normal stresses on plane $b - b$ and the principal stresses.



4. The wood beam is subjected to a load of 12 kN . If grains of wood in the beam at point A make an angle of 25° with the horizontal as shown find the normal and shear stress that act perpendicular to the grains.



5. Draw Mohr's circle for the stress state in problem 4 and use it to estimate the principal stresses.
6. The 45° strain rosette is mounted on the surface of a shell with the following readings: $\epsilon_a = -200\mu\epsilon$, $\epsilon_b = 300\mu\epsilon$ and $\epsilon_c = 250\mu\epsilon$. Find the in-plane principal strains.



7. A material is subjected to principal stresses σ_x and σ_y . Find the orientation, θ , of the strain gage so that its reading of normal strain corresponds only to σ_y , not σ_x . The relevant material constants for this problem are E and ν (express answer in terms of these)

