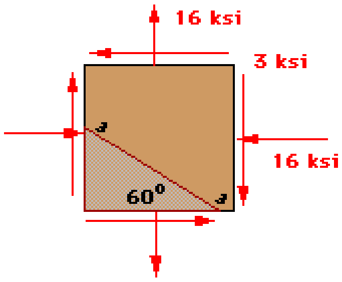
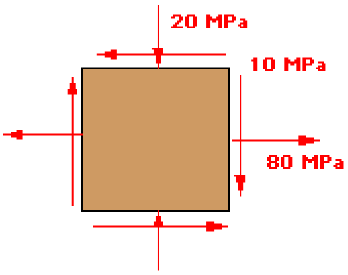
1)



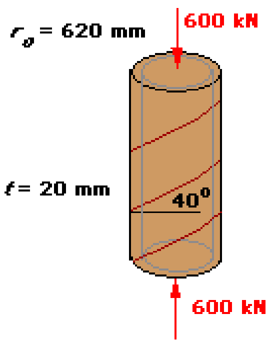
The state of stress at a point in a structural member is determined to be as shown. Using transformation equations, determine the normal and shearing stresses acting on plane *a* - *a*.

2)



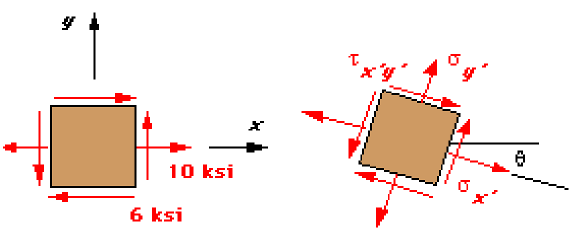
The state of stress at a point in a structural member is determined to be as shown. Using the appropriate equations, determine the maximum and minimum normal stresses, principal angle, and maximum in-plane shear stress at this point.

3)



A closed-end pressure vessel has an inside diameter of 1200 mm and a wall thickness of 20 mm. It is pressurized to an internal pressure of 5 MPa and has a centric compressive force of 600 kN applied as shown. The tank is welded together along a helix making an angle of 40° to the horizontal. Determine the normal and shearing stresses along the helix.

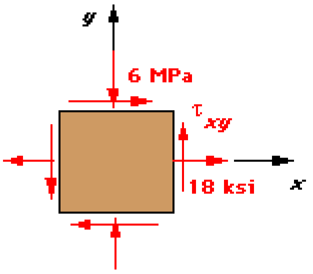
4)



For the state of plane stress shown, determine the range of angles θ for which

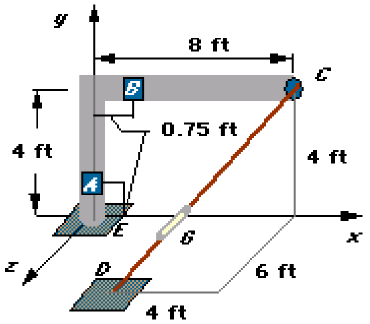
$\sigma_{x'} \leq +11.5$ ksi

5)



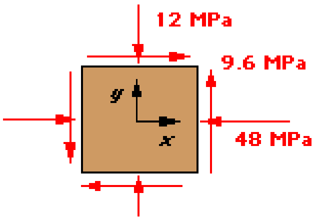
Determine the magnitude of the shearing stress that can be sustained by this element so that the maximum principal stress does not exceed 24 ksi.

6)



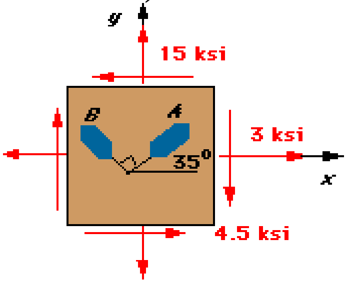
The uniform 3.5-in.-radius bracket shown is fixed to the ground at *E*. Cable *CD* has a tensile force of 4 kip produced by turnbuckle *G*. Determine the principal stresses and the principal angle at point *A* or *B*. Click on the point you wish to consider.

7)



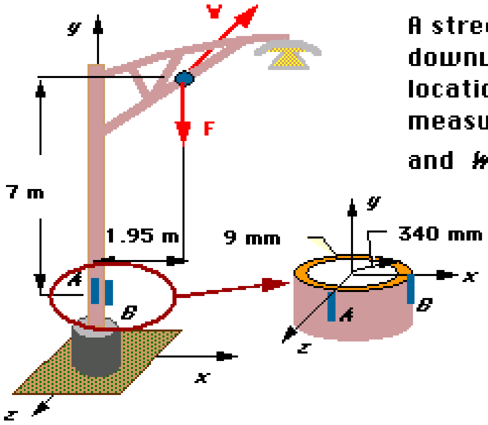
The state of stress at a point in a structural member is determined to be as shown. Knowing that for this material E = 200 GPa and ν = 0.3, use Mohr's circle to determine the principal strains and the principal angle associated with this state of stress.

8)



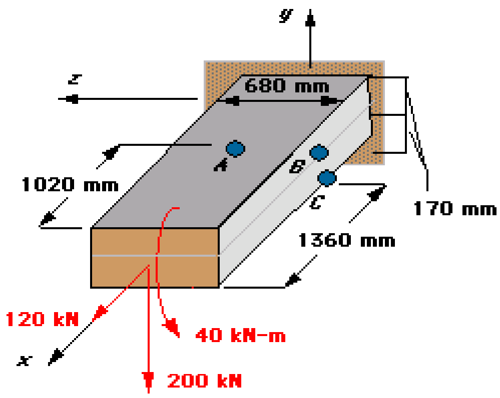
The state of stress at a point in a structural member is as shown. Two strain gages are applied to the surface of the member. The orientation of gage *A* is as shown. Strain gage *B* is perpendicular to gage *A*. Knowing that for this material $E = 10 \times 10^6$ psi and ν = 0.33, use Mohr's circle to determine the strain in gages *A* and *B*.

9)



A street light with E = 70 GPa and ν = 0.33 is subjected to a downward force (F) and a wind load (W) as shown. At the location indicated, two strain gages are applied so that they measure the strain in the y direction. Determine the loads F and W knowing that ε_A = 350 μ and ε_B = -26 μ.

10)



The 340 × 680-mm cantilevered beam shown is subjected to the loads indicated. Determine the principal stresses and the principal angle at point A or B or C. Click on the point you wish to consider. . Click the exit arrow to exit this quiz.