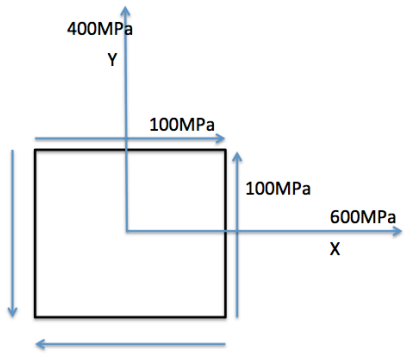
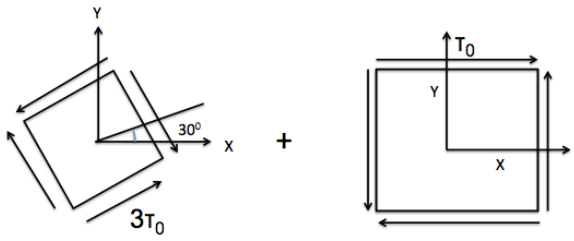
Assignment 3 , MM203

1. What are the principal stresses acting on the material and at what orientation to the current X-Y axis.

What is the maximum shear stress and at what angle to the current X-Y axis?



2. Find the principal stress directions **using Mohr circle** with respect to the current X-Y axis if the stress at a point is the sum of the two states of stress illustrated.



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5.8. The stresses in a flat steel plate in a condition of plane stress are

$$\sigma_x = 130 \text{ MN/m}^2$$
$$\sigma_y = -70 \text{ MN/m}^2$$
$$\tau_{xy} = 80 \text{ MN/m}^2$$

Find the magnitude and orientation of the principal strains in the plane of the plate. Find also the magnitudes of the third principal strain (perpendicular to the plane of the plate).

4.A long cylindrical pressure vessel with closed ends is to be made by rolling a strip of plastic of thickness d and width w into a helix and making a continuously fused joint, as illustrated. It is desired to subject the fused joint to a tensile stress only 80 percent of the maximum in the parent plastic. What is the minimum tilt of strip of plastic?