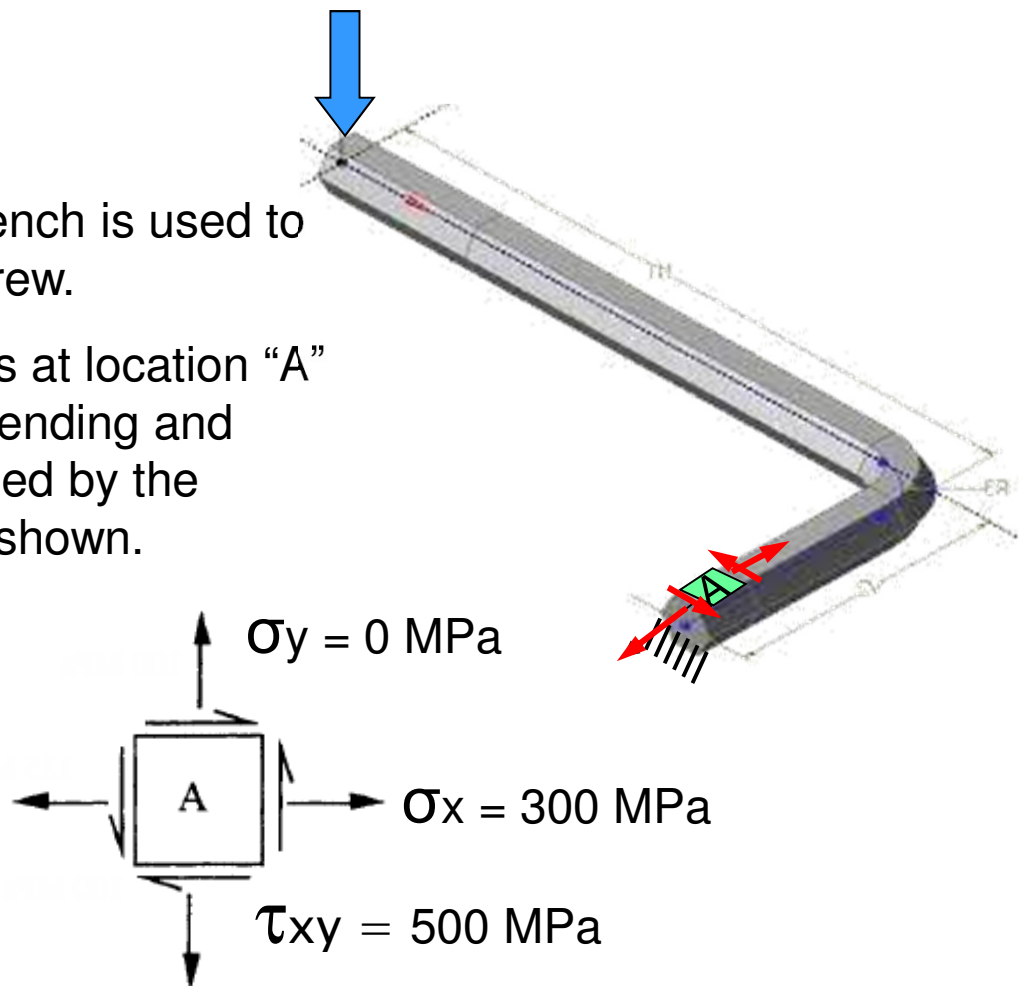


MEEG3311 Homework 1 – Chapter 2

1.1

An Allen wrench is used to tighten a screw.

The stresses at location “A” due to the bending and torsion applied by the wrench are shown.



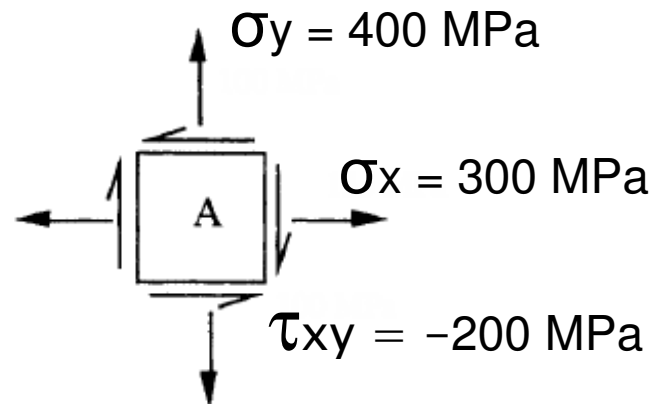
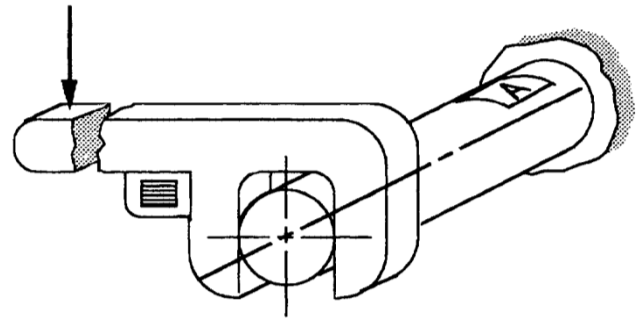
A. Draw the Mohr's circle for these stresses.

B. Calculate the principal stresses and show the angle of the maximum principal stress.

1.2

A small pressurized cylinder is attached to a wall at one end and is loaded with a pipe wrench at the other.

The stresses at location "A" due to the internal pressure and wrench torsion are shown.



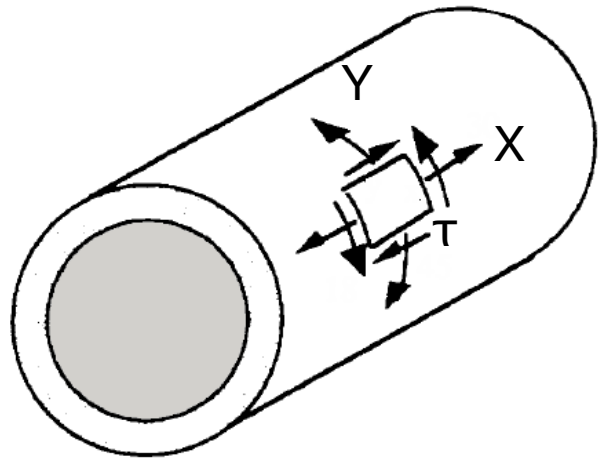
A. Draw the Mohr's circle for these stresses. [Note that you will need to include the $\sigma_z=0$ point to get the max shear stress. This represents zero radial stress at the outer surface.]

B. Calculate the principal stresses and show the angle of the maximum principal stress. (The direction that a strain gauge should be oriented.)

1.3

An internally pressurized steel tube sees axial (X) and tangential (Y) stresses on the outer surface of 30 ksi and 45 ksi, respectively.

It is also torsionally loaded with a shear stress of 18 ksi.



A. Draw the Mohr's circle for these stresses. [Note that you will need to include the $\sigma_z=0$ point to get the max shear stress. This represents zero radial stress at the outer surface.]

B. Calculate the principal stresses and show the angle of the maximum principal stress. (The direction that a strain gauge should be oriented.)