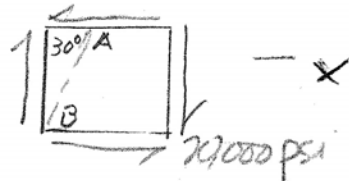


Names: _____

Key

The stresses at a point are pure shear in the x-y frame of reference as shown. Determine the stresses on the plane A-B

σ (on plane A-B) = 17,320 Tension
 τ (n plane A-B) = -10,000



$$\sigma_x = \sigma_y = 0 \quad \tau_{xy} = -20,000$$

$$\theta = -30^\circ$$

$$\sigma_{x'} = \left(\frac{\sigma_x + \sigma_y}{2} \right) + \left(\frac{\sigma_x - \sigma_y}{2} \right) \cos 2\theta + \tau_{xy} \sin 2\theta$$

$$= 0 + 0 + (-20,000) (\sin(-60)) = +17,320 \text{ psi}$$

$$\tau_{x'y'} = - \left(\frac{\sigma_x - \sigma_y}{2} \right) \sin 2\theta + \tau_{xy} \cos 2\theta$$

$$= 0 + (-20,000) \cos(-60) = -10,000 \text{ psi}$$