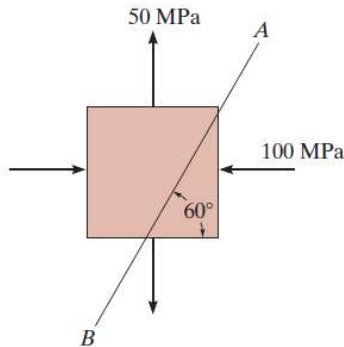


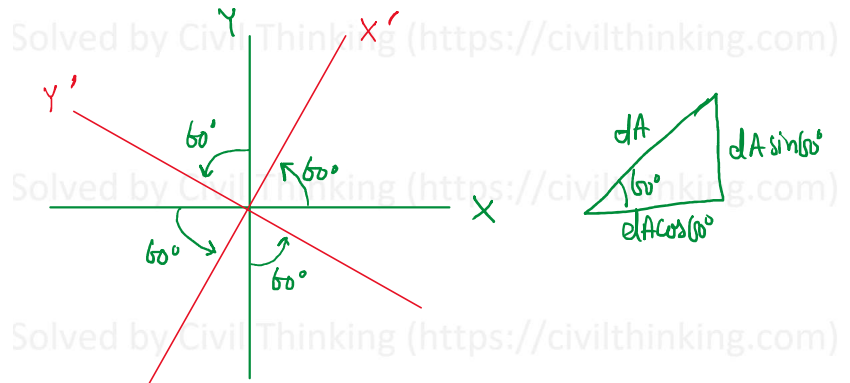
Plane Stress Transformation question solution using Method of Equilibrium

9-13. Determine the stress components acting on the inclined plane AB . Solve the problem using the method of equilibrium described in Sec. 9.1.



Prob. 9-13

Mechanics of Materials, R.C. Hibbeler 10th Ed. Pearson

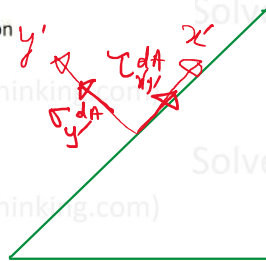


$$\sum F_{y'} = 0 :$$

$$\sigma_{y'} dA + 100 dA \sin 60^\circ \sin 60^\circ - 50 dA \cos 60^\circ \cos 60^\circ = 0$$

$$\Rightarrow \sigma_{y'} = -62.5 \text{ MPa}$$

compressive.



$$\sum F_{x'} = 0 :$$

$$\tau_{x'y'} dA - 100 dA \sin 60^\circ \cos 60^\circ - 50 dA \cos 60^\circ \sin 60^\circ = 0$$

$$\Rightarrow \tau_{x'y'} = 64.9 \text{ MPa}$$

This problem was solved by Civil Thinking (<https://civilthinking.com>)

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