

Advanced rock mechanics

Semester 1, 2009

Homework #7 (May)

1. Stress transformation can take a simple form when complex variable is introduced. Expand the following equations and check the validity of them. The primed subscripts indicate the transformed axis.

$$\tau_{y'y'} - \tau_{x'x'} + 2i\tau_{x'y'} = (\tau_{yy} - \tau_{xx} + 2i\tau_{xy})e^{2i\theta}$$

$$\tau_{xx} + \tau_{yy} = \tau_{x'x'} + \tau_{y'y'}$$

2. Derive the Cauchy-Riemann Equations and discuss its importance for engineering application.