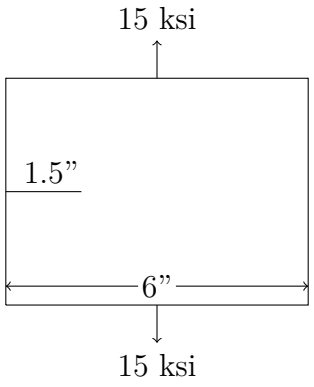
Last Updated: February 6, 2020 at 3:01pm

Name:

Homework 3

Due 13 Feb 2020

1. Determine the stress intensity for the edge cracked panel ($\sigma_{YS} = 65$ ksi)
   (a) Without any plastic zone adjustment
   (b) With a plane stress plastic zone adjustment
   (c) With a plane strain plastic zone adjustment
   (d) For $t = 0.25$”



2. Plot effective (plastic) stress intensity over elastic stress intensity vs. applied stress over yield stress (K_e/K vs. σ/σ_{YS}) for an infinitely wide center-cracked panel in plane strain.

3. Determine K_e/K for a finite width center cracked panel in the following cases ($\sigma = 45$ ksi, $\sigma_{YS} = 75$ ksi,)
   (a) $2a = 2$”, $W = 7$”, plane strain
   (b) $2a = 2$”, $W = 7$”, plane stress
   (c) $2a = 2$”, $W = 7$”, plot for varying thickness, 1/4” to 1”

4. Plot the plastic zone shape according the structure shown ($\sigma_{YS} = 75$ ksi, $\nu = 0.3$).
   (a) Plane stress, Von Mises Yield Theory
   (b) Plane strain, Von Mises Yield Theory