Name:

Homework 6

Due 31 October 2019

1. In an infinitely wide, center-cracked panel we have

$$K_I = \sigma\sqrt{\pi a} \qquad \text{and} \qquad K_{II} = \tau\sqrt{\pi a}$$

Compare predictions of the crack propagation direction for $\sigma = \tau/3$ and $\sigma = 7\tau/4$ using the following methods:

- Maximum tensile stress
- Minimum strain energy density
- Maximum energy release rate
- Finite Elements

Note: There are many ways this could be done in finite elements, using either XFEM or an automated re-meshing tool (e.g. FRANC2D) to actually propagate a crack and measure its direction OR evaluating the hoop stress, strain energy density, or strain energy release rate around the crack tip.