8.8 For this problem, we are given values of K_{Ic} ($82.4 \text{ MPa}\sqrt{\text{m}}$), σ (345 MPa), and Y (1.0) for a large

plate and are asked to determine the minimum length of a surface crack that will lead to fracture. All we need do is
to solve for a_c using Equation 8.7; therefore

$$a_c = \frac{1}{\pi}\left(\frac{K_{Ic}}{Y\sigma}\right)^2 = \frac{1}{\pi}\left[\frac{82.4 \ \text{MPa}\sqrt{\text{m}}}{(1.0)(345 \ \text{MPa})}\right]^2 = 0.0182 \ \text{m} = 18.2 \ \text{mm} \quad (0.72 \ \text{in.})$$