

## Find The Roots of the Following Equation using python

Initial Guess

$t_{clpsi} := 0.010 \text{ m}$  Given

$$P_0 = 1.005 \times 10^7 \text{ Pa}$$

$$f_0 = 0.600$$

$$S_y = 4.502 \times 10^8 \text{ Pa}$$

$$t_{clpsi} = 0.010 \text{ m}$$

$$D = 0.508 \text{ m}$$

$$E = 1.999 \times 10^{11} \text{ Pa}$$

$$\nu = 0.300$$

$$\frac{P_0}{f_0} = \frac{2 \cdot S_y \cdot \frac{t_{clpsi}}{D} \left[ 2 \cdot E \cdot \left( \frac{t_{clpsi}}{D} \right)^3 \right]}{\sqrt{\left( 2 \cdot S_y \cdot \frac{t_{clpsi}}{D} \right)^2 + \left[ 2 \cdot E \cdot \left( \frac{t_{clpsi}}{D} \right)^3 \right]^2}}$$

$$t_{ci} := \text{Find}(t_{clpsi})$$

Expected Result

$$t_{ci} = 18.0382 \cdot \text{mm}$$

Ref: <https://kite.com/python/examples/1011/scipy-find-the-roots-of-a-function>