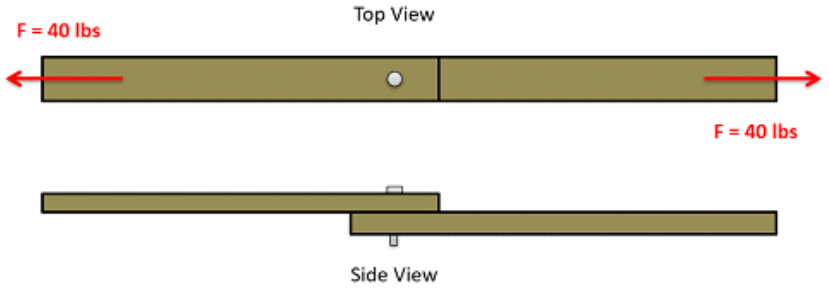
Problem 1

A single steel nail holds two wooden boards together as shown below. Assume the nail has a circular cross section with an eighth inch diameter. A 40 lb tensile force is then applied to the boards. What is the shear stress in the nail?



$$d = .125\ in$$

$$r = .0625\ in$$

$$\tau = \frac{V}{A} = \frac{40\ lbs}{\pi\,(.0625_{in})^2} = 3259.5\ \frac{lbs}{in^2}$$

$$\tau = 3.26\ ksi$$