

$$\sigma_{AB} = 2 \sigma_{BC} \quad P = ?$$

$$\sigma_{AB} = \frac{P}{\pi (1)^2} = \frac{P}{\pi}$$

$$\sum F_x = 0: \quad \text{(Pipe)}$$

$$-P + 30 + 30 - F_{BC} = 0$$

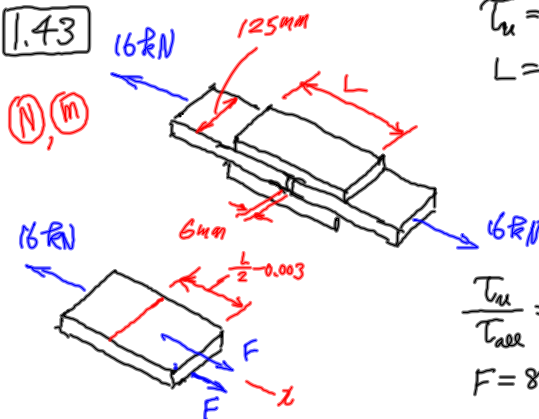
$$F_{BC} = 60 - P \quad \sigma_{BC} = \frac{F_{BC}}{\pi (1.5)^2}$$

$$\frac{P}{\pi} = 2 \cdot \frac{60 - P}{\pi (1.5)^2}, \quad \therefore P = \boxed{0} \quad P = \boxed{0} \text{ kip}$$

1 kip = 1 kilopound = 1000 pounds | kip = 1000 lb

lb: libra librae | lb, 2 lb, 1 m, 2 m

1.43



$$\tau_u = 2.5 \text{ MPa}, \quad F.S. = 2.75$$

$$L = ?$$

$$\sum F_x = 0:$$

$$F + F - 16 = 0$$

$$2F = 16, \quad F = 8$$

$$\frac{\tau_u}{\tau_{all}} = F.S. \quad \tau_u = 2.5 \times 10^6 \text{ Pa}$$

$$F = 8 \text{ kN} = 8 \times 10^3 \text{ N}$$

$$\tau_{all} = \frac{8 \times 10^3}{(\frac{L}{2} - 0.003)(0.125)} \quad (\text{Pa})$$

$$\tau_u = (F.S.) \tau_{all}$$

$$2.5 \times 10^6 = 2.75 \left[\frac{8 \times 10^3}{(\frac{L}{2} - 0.003)(0.125)} \right], \quad L = \boxed{0} \quad L = \boxed{0} \text{ m}$$