

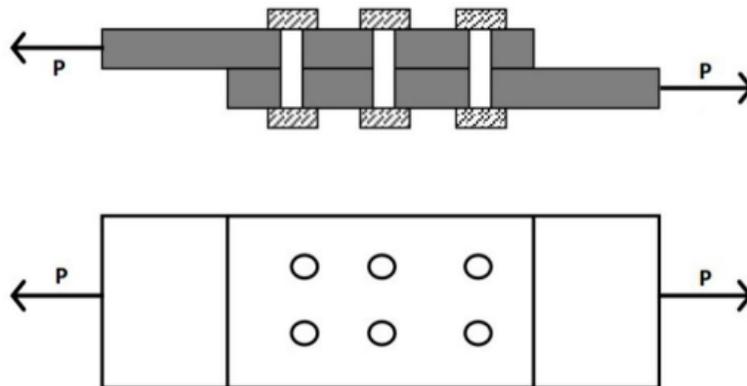
SHOW ALL WORK FOR FULL CREDIT. DO YOUR OWN WORK.

Name: _____

Helpful Formulas

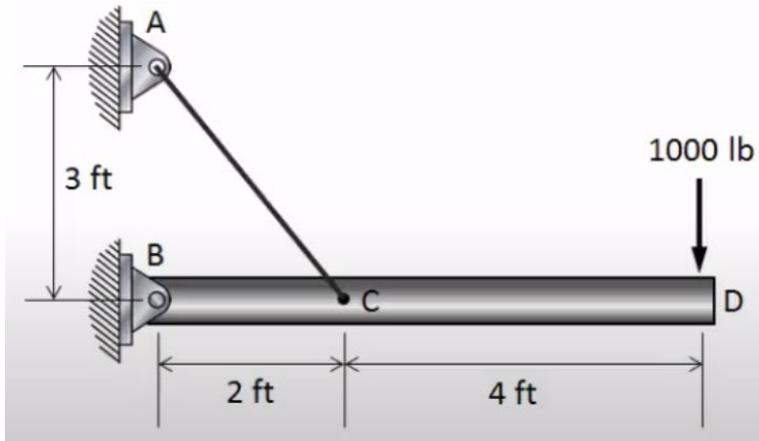
Normal Stress	$\sigma = \frac{P}{A}$	Linear Strain	$\epsilon = \frac{\delta}{L}$
Shear Stress	$\tau_{avg} = \frac{P}{A_s}$	Hooke's Law	$\frac{\sigma}{\epsilon} = E$ OR $\sigma = E\epsilon$
Bearing Stress	$\sigma_b = \frac{P}{\text{projected area}} = \frac{P}{td}$	Axial Deformation	$\delta = \frac{PL}{AE}$

- The steel plates shown are subjected to an applied tensile load of 36 kips. The connection is made using six 3/4 in. diameter metal bolts. The plates are 3/4 in thick and 8 in wide. Calculate the shear stress that must be developed in the bolts to keep the connection intact. Give answer in ksi



Solution.

2. The rigid pipe is supported by a pin at B and an A36 steel wire connected between points B and D at point C. The wire has a diameter of 0.375 inches. For the load shown, the tensile force in the guy wire is 3606 lb. Determine the stress in the cable (in ksi) and verify that it is less than the yield stress for A36 steel ($\sigma_y = 36$ ksi). If Hooke's Law applies, determine the elongation of the wire in inches.
 $E = 30 \times 10^3$ ksi



Solution.