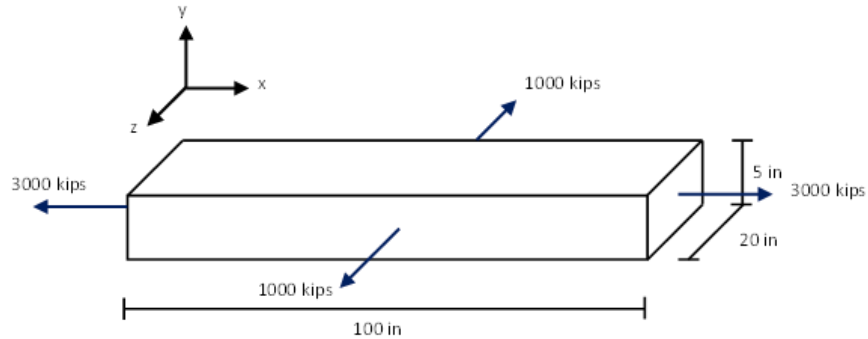1. List the different theories of failure. Why are there multiple theories of failure and when is it appropriate to use each one?

2. If the steel bar below has a yield stress of 50 ksi, determine the factor of safety with respect to yielding if the maximum shear stress theory is considered.

3. Consider the same steel bar above. Determine if yielding has occurred based on the maximum distortion energy theory.

4. A short concrete cylinder has a diameter of 6 inches and is subjected to an axial compressive force of 50 kips. Determine if the cylinder fails if the ultimate stress of the concrete is 3 ksi.