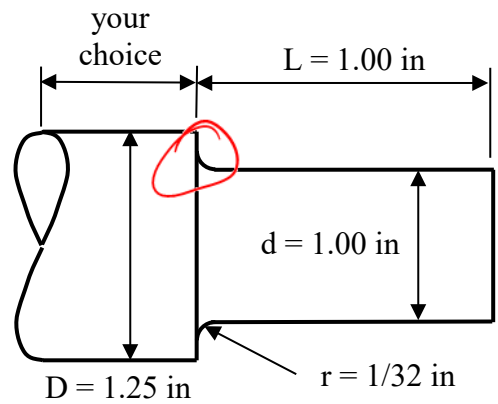
ME 360 – P01 Name _____

USE THIS SHEET AS THE FIRST PAGE OF YOUR PROJECT SUBMISSION

1) Use SolidWorks (SW) FEA to apply a bending load of 1200 lbf on the right end of the stepped shaft as shown below. This is the same geometry as H01. Estimate stress concentration factor K_t for bending from your FEA. Provide a hardcopy color plot of your FEA showing maximum von Mises stress.

$K_{t_bending} = \sigma_{FEA_bending} / \sigma_{NOMINAL_bending}$

$K_{t_bending}$ _____



SAE 1045 cold-rolled steel

2) Use SW FEA to apply an axial torque of 1000 in.lbf on the right end of the stepped shaft. Determine stress concentration factor K_t for torsion from your FEA. Provide a hardcopy color plot of your FEA showing maximum von Mises stress. <u>Note that you must convert von Mises stress to shear stress in order to compute stress concentration factor per below.</u>

$K_{t_torsion} = \tau_{FEA_torsion} / \tau_{NOMINAL_torsion} \neq \sigma'_{FEA} / \tau_{NOMINAL_torsion}$

$K_{t_torsion}$ _____

$K_t \neq \sigma'_{FEA} / \tau_{NOMI}$

3) Compare your results to theoretical values using the table below.

$K_{t_bending}$ your FEA	$K_{t_bending}$ theory	$K_{t_torsion}$ your FEA	$K_{t_torsion}$ theory

match

match