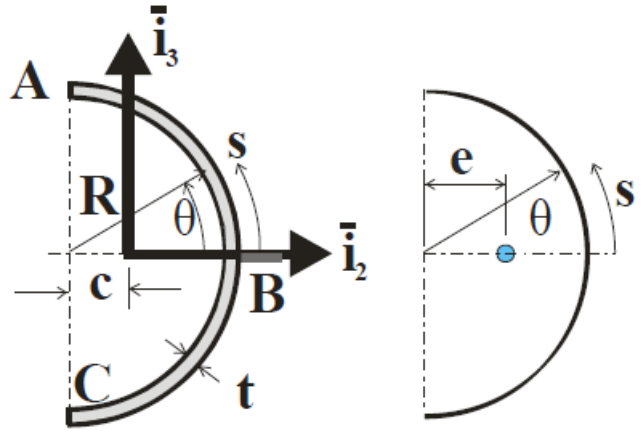
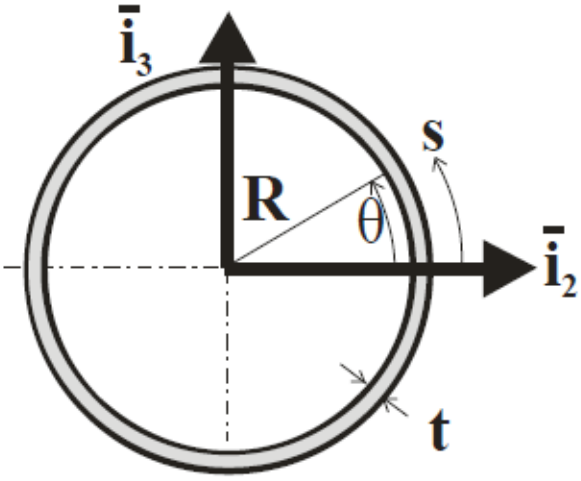
HW #3

Problem 8.27 Shear center on semicircular section



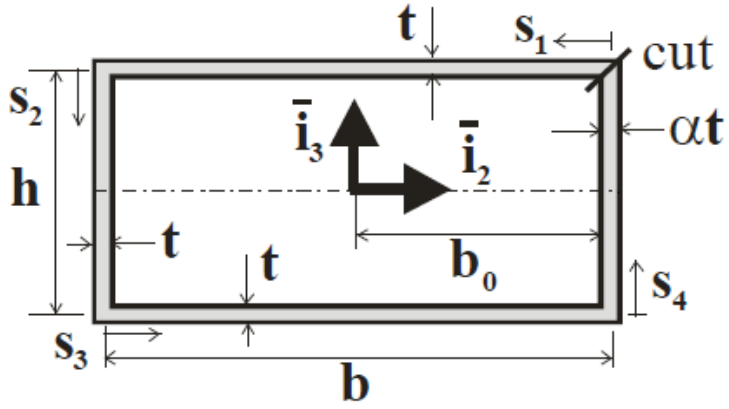
Determine the location of the shear center of the thin-walled, semi-circular open corss-section shown in fig.

Problem 8.31 Shear flow in circular section



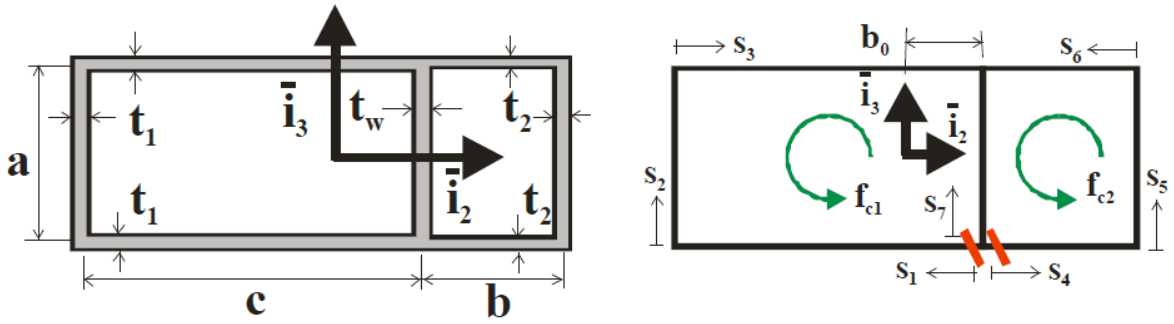
Consider a beam with a thin-walled, circular cross-section of radius R and thickness t. The section is subjected to a vertical shear force, V3. (1) Determine the bending stiffnesses of the section. (2) Find the shear flow distribution in the section. (3) Find the location and magnitude of the maximum shear flow in the section.

Problem 8.32 Shear flow in closed rect. section



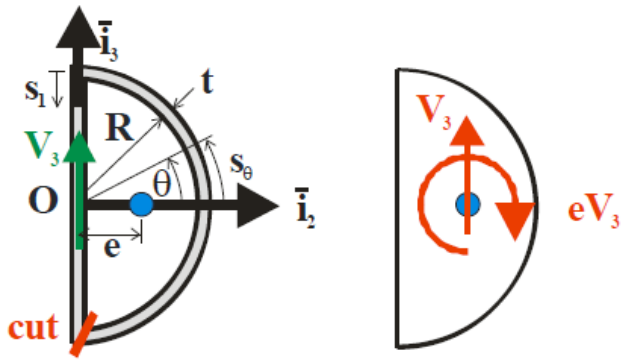
The thin-walled beam with a rectangular section depicted in fig. is subjected to a vertical shear force V3. (1) Determine the centroidal bending stiffnesses of the section. (2) Find the shear flow distribution in the section. (3) Verify that all joint and edge equilibrium conditions, eq.(8.29), are satisfied. (4) Find the location and magnitude of the maximum shear flow in the section. Use the following data: $\alpha = 1.0$

Problem 8.38 Shear flow in double box section



The cross-section of the multi-cellular thin-walled beam shown in fig. is subjected to a vertical shear force V3. (1) Find the shear flow distribution in the section. (2) Verify that all joint and edge equilibrium conditions, eq. (8.29), are satisfied. Use a = b and c =2b and t1=t2=tw=t.

Problem 8.54 Shearing & torsion of semicircular section



A beam with the closed semi-circular thin-walled cross-section shown in fig. is subjected to a vertical shear force, V3, with a line action passing through the section's vertical web. (1) Determine the location of the section's shear center. (2) Determine the shear flow distribution due to shearing. (3) Determine the shear flow distribution due to torsion. (4) Determine the total shear flow distribution.