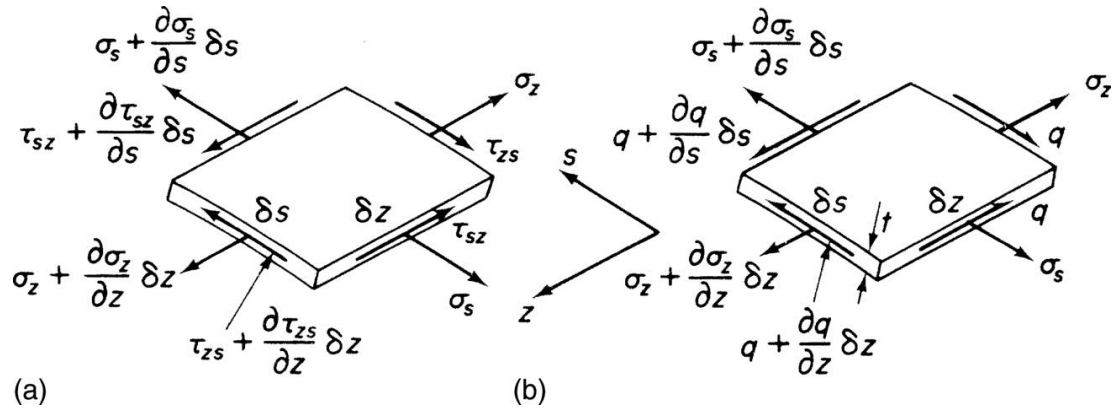# Chapter 17
Shear of beams

FIGURE 17.1 (a) General Stress System on an Element of a Closed or Open Section Beam; (b) Direct Stress and Shear Flow System on the Element
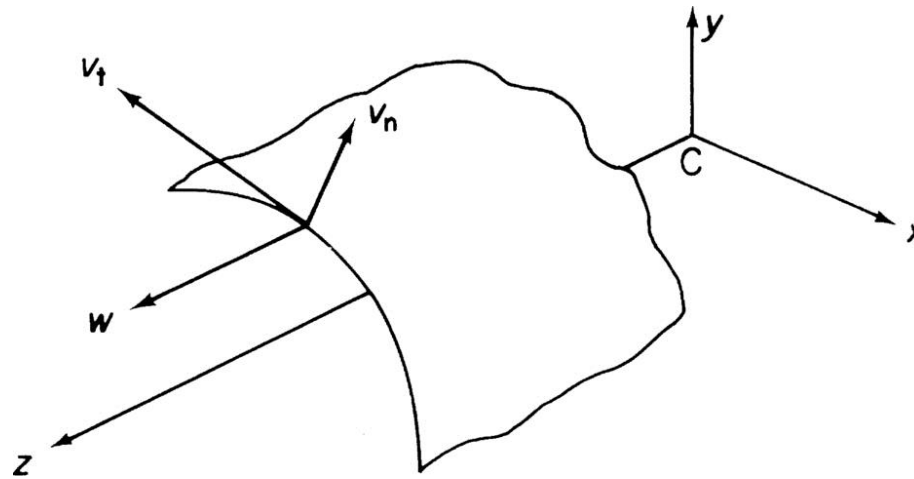
FIGURE 17.2 Axial, Tangential, and Normal Components of Displacement of a Point in the Beam Wall
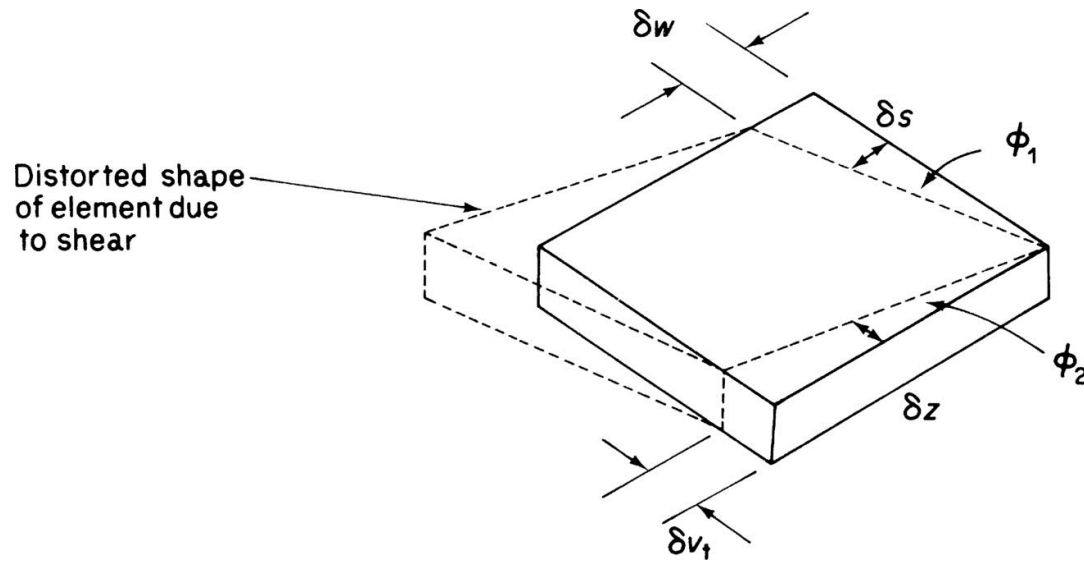
FIGURE 17.3 Determination of Shear Strain γ in Terms of Tangential and Axial Components of Displacement
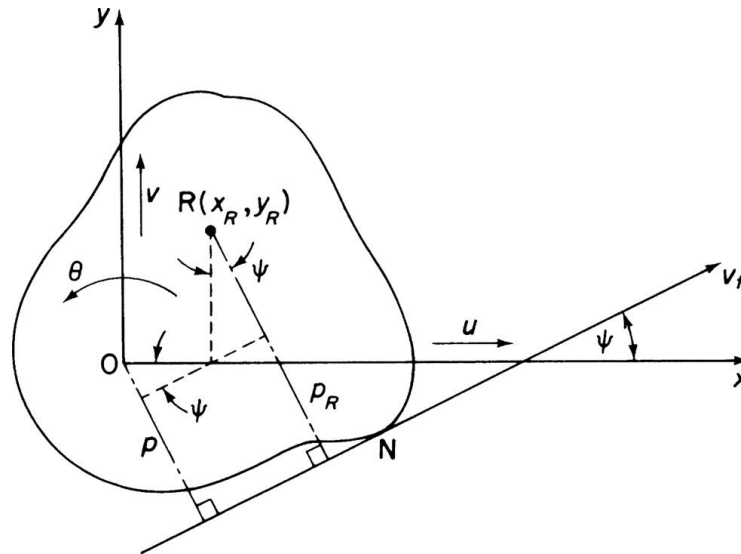
FIGURE 17.4 Establishment of Displacement Relationships and Position of Center of Twist of Beam (Open or Closed)
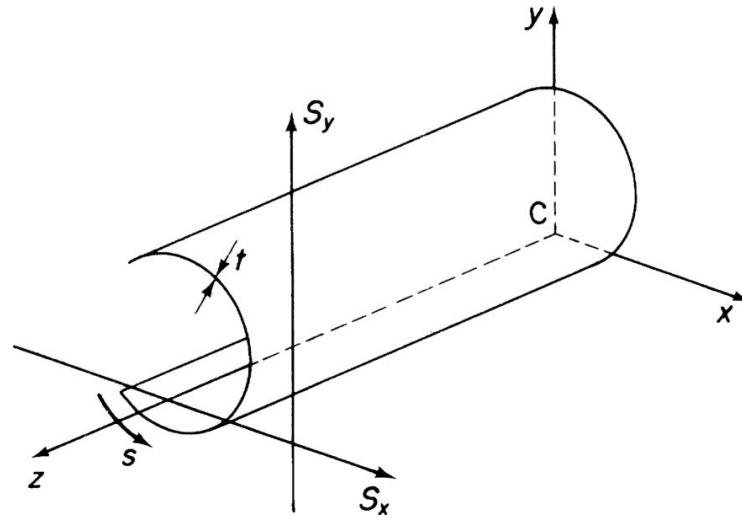
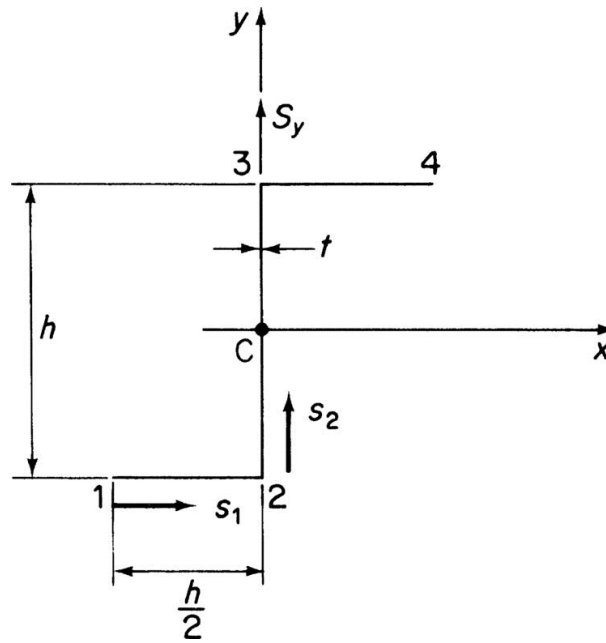**FIGURE 17.5** Shear Loading of an Open Section Beam

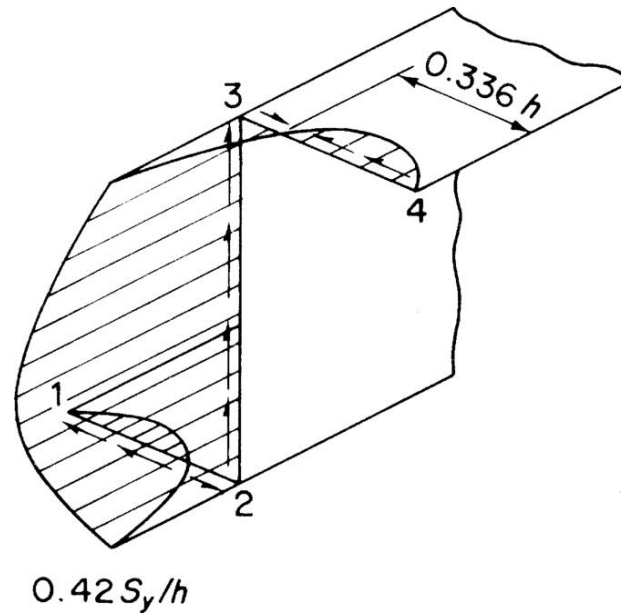**FIGURE 17.6** Shear Loaded *Z* Section of Example 17.1

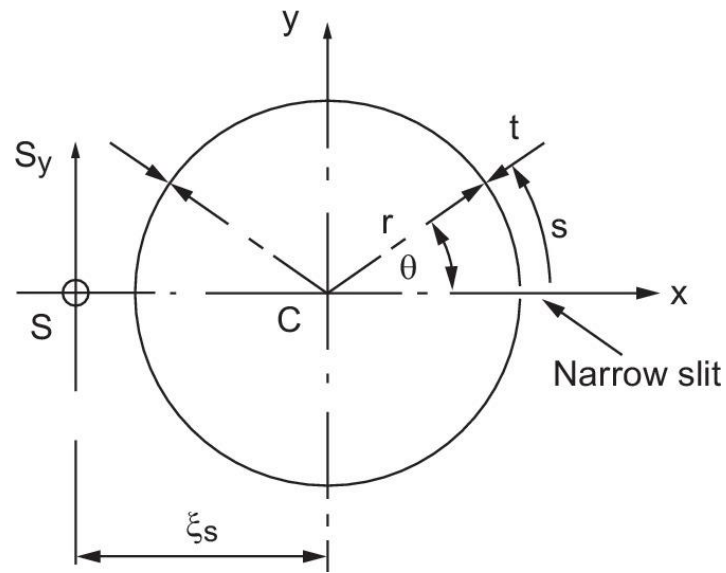**FIGURE 17.7** Shear Flow Distribution in Z Section of Example 17.1
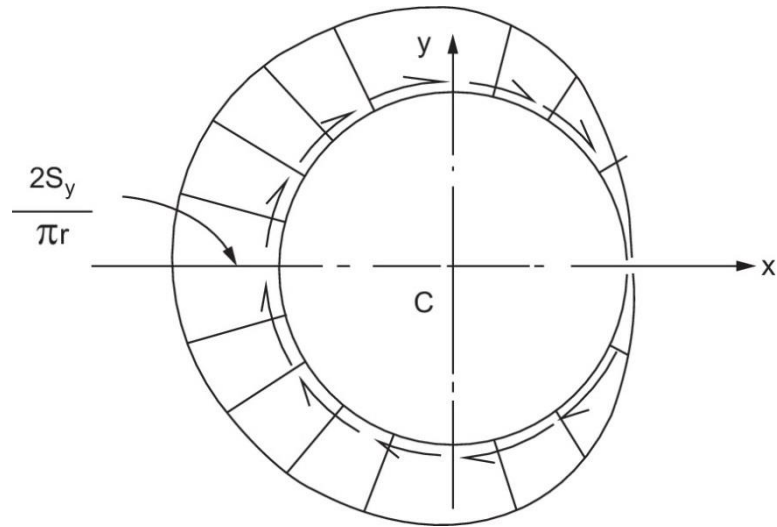
FIGURE 17.8 Beam Section of Example 17.2

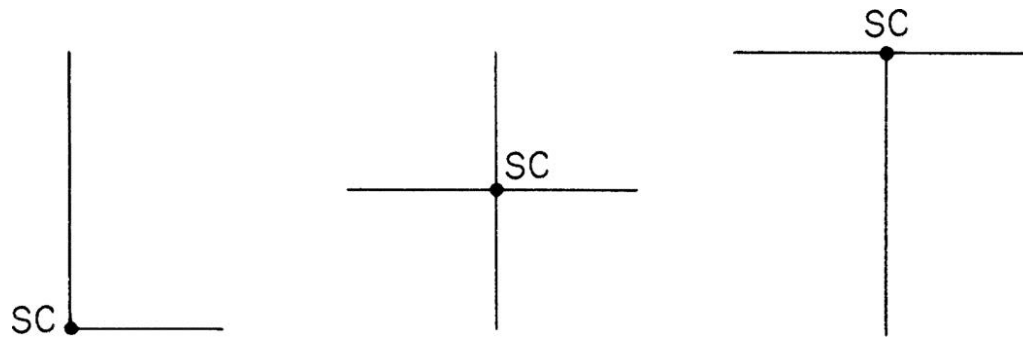**FIGURE 17.9** Shear Flow Distribution in the Section of Example 17.2

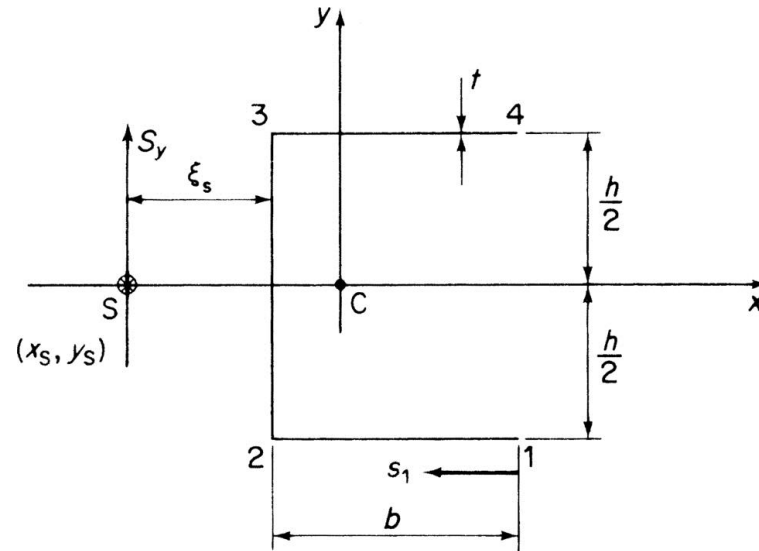**FIGURE 17.10** Shear Center Position for the Type of Open Section Beam Shown

FIGURE 17.11 Determination of Shear Center Position of Channel Section of Example 17.3
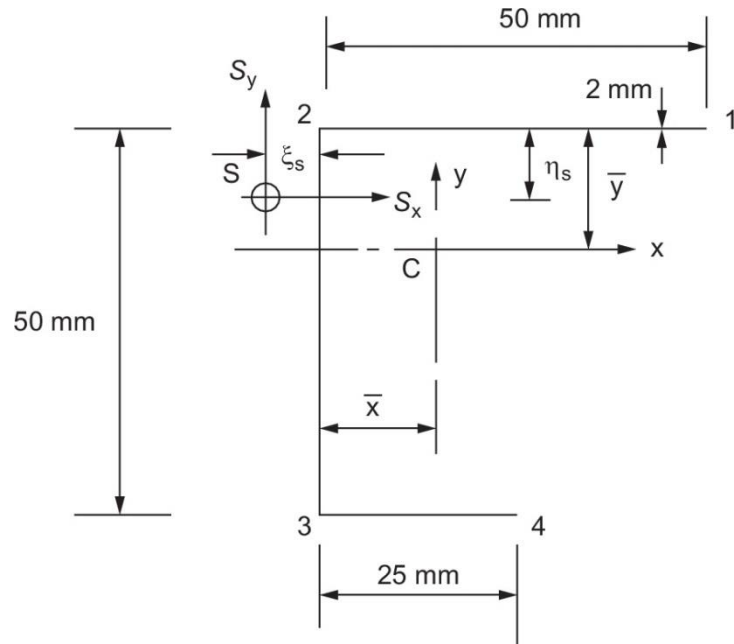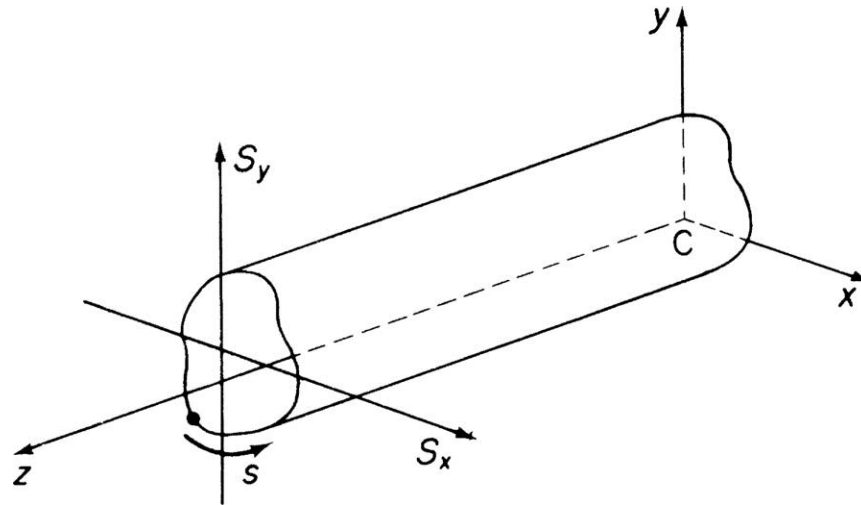
FIGURE 17.12 Beam Section of Example 17.5
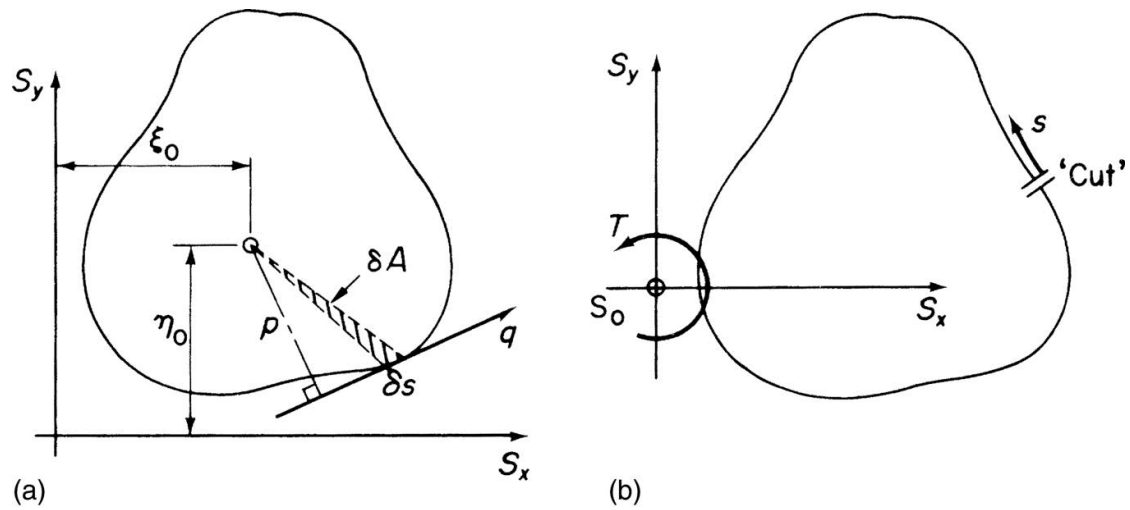
FIGURE 17.13 Shear of Closed Section Beams

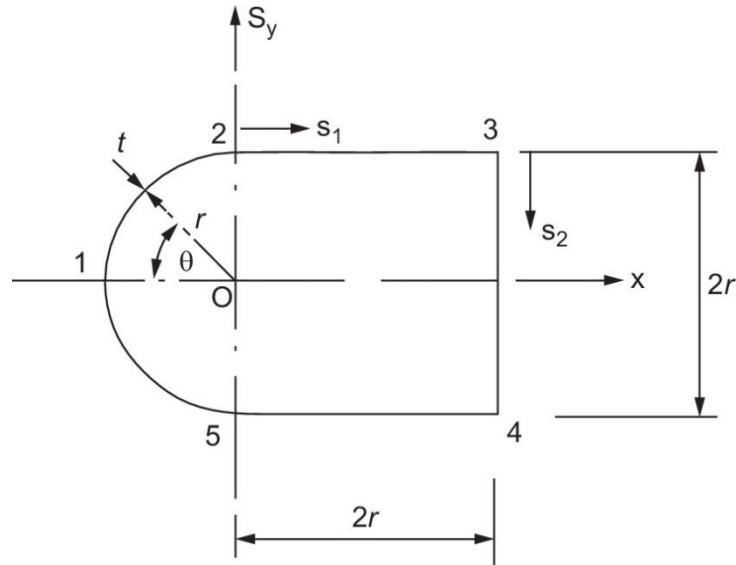**FIGURE 17.14** (a) Determination of $q_{s,0}$; (b) Equivalent Loading on an "Open" Section Beam
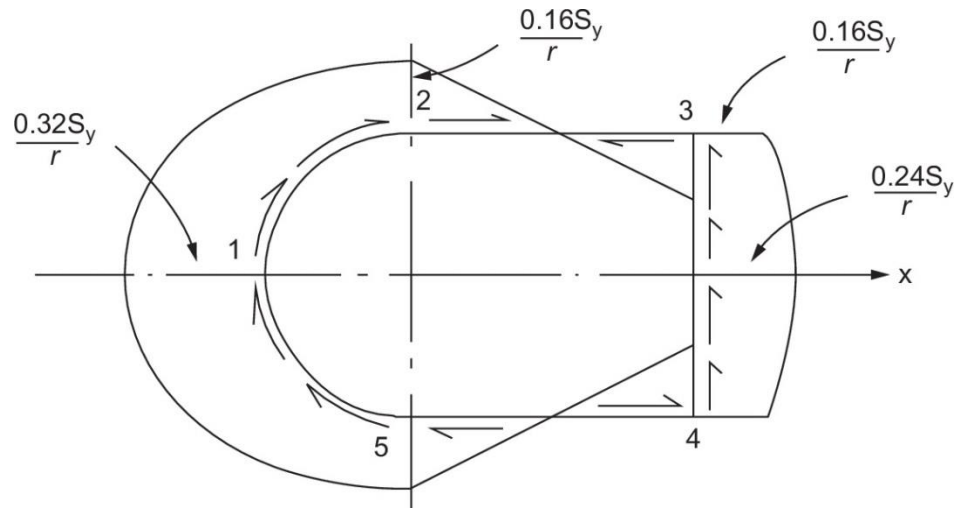
FIGURE 17.15 Beam Section of Example 17.6

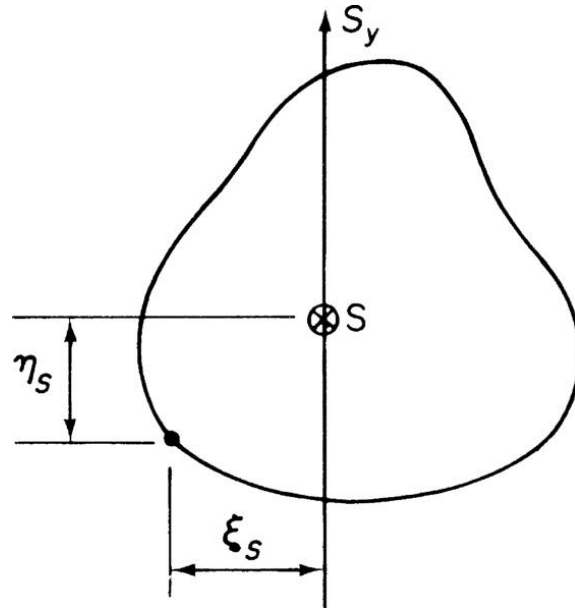**FIGURE 17.16** Shear Flow Distribution in Beam Section of Example 17.6

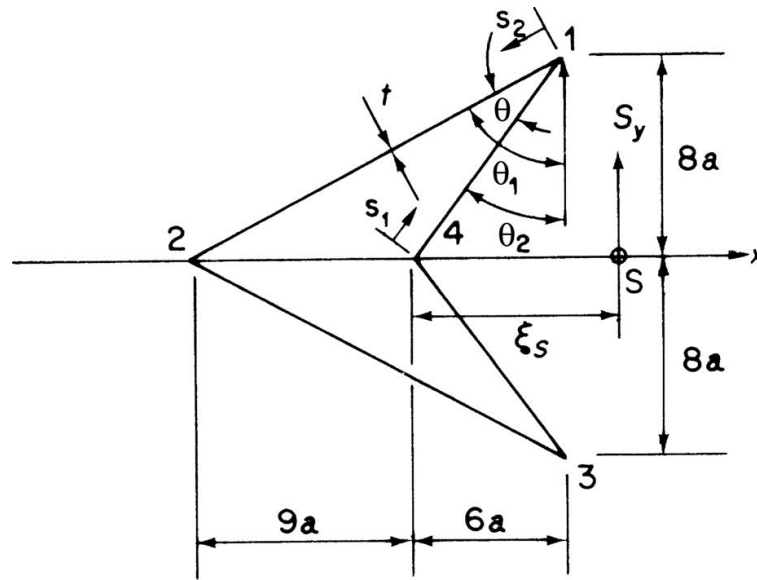**FIGURE 17.17** Shear Center of a Closed Section Beam

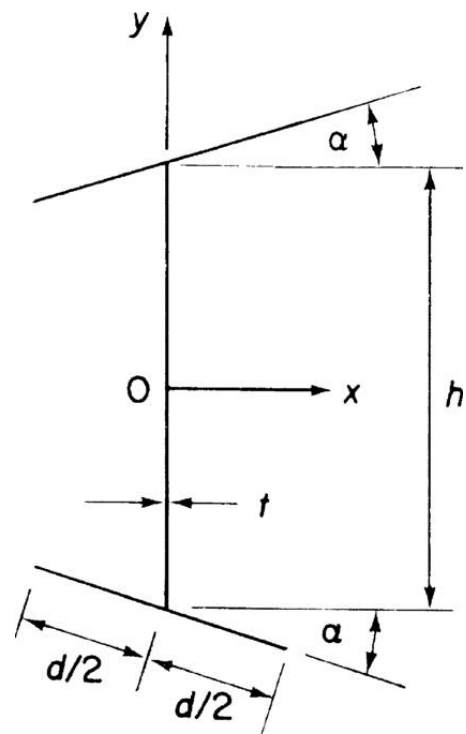**FIGURE 17.18** Closed Section Beam of Example 17.7

FIGURE P.17.1
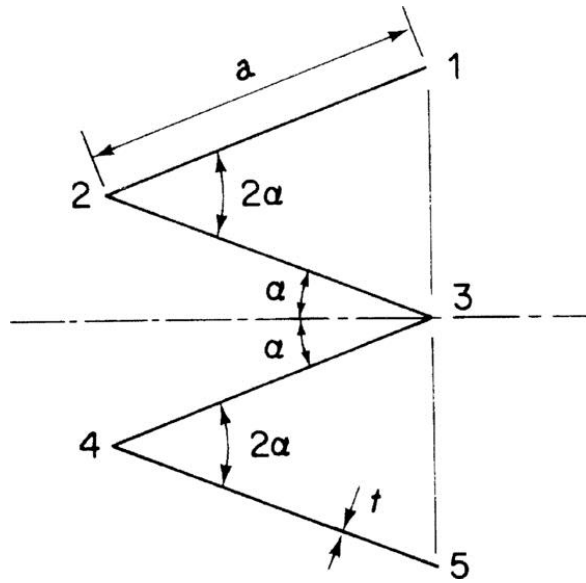
FIGURE P.17.2
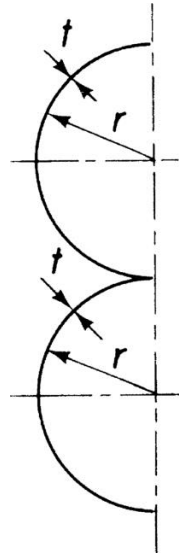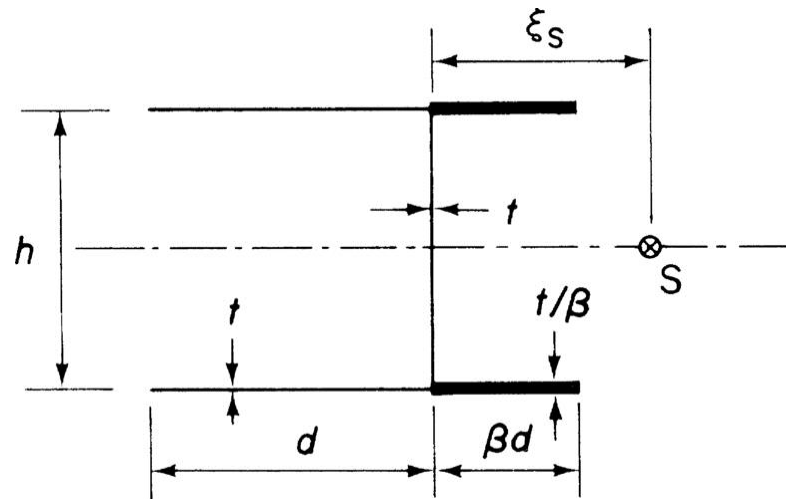
FIGURE P.17.3

FIGURE P.17.4
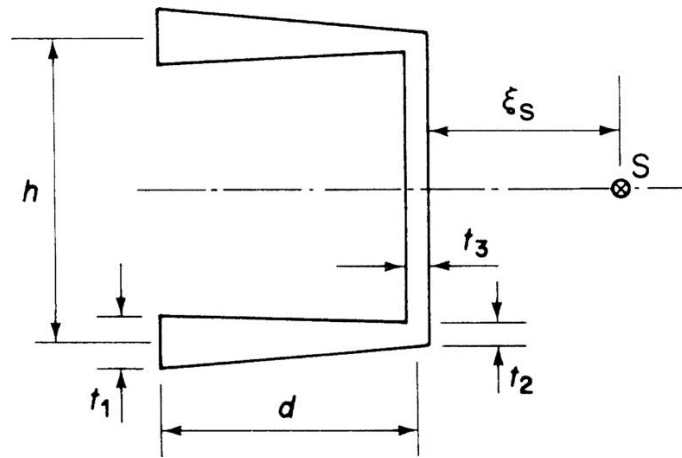
FIGURE P.17.5
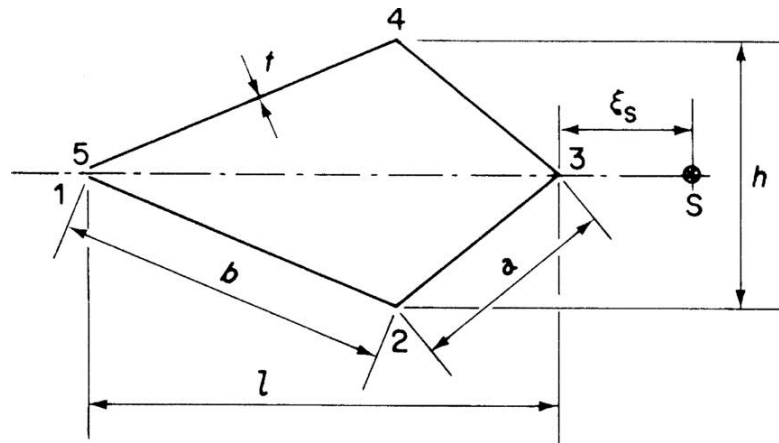
FIGURE P.17.6
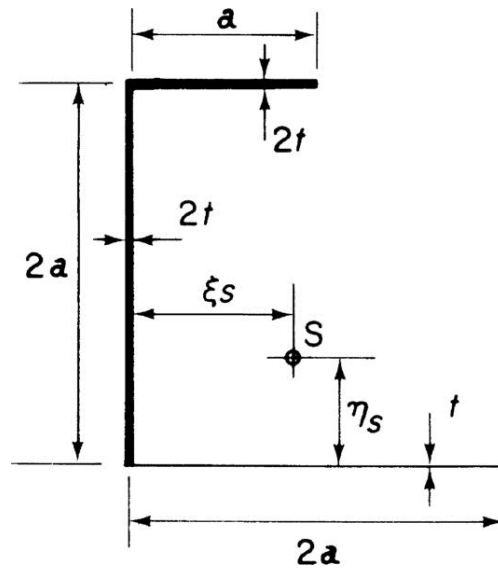
FIGURE P.17.7
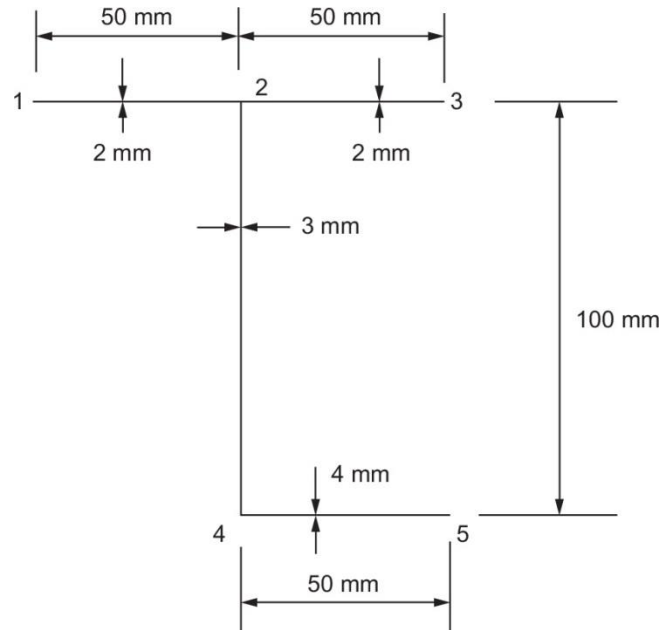
FIGURE P.17.8
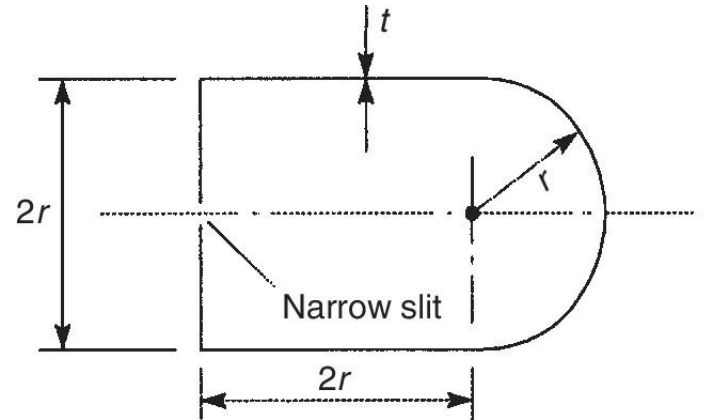
FIGURE P.17.9
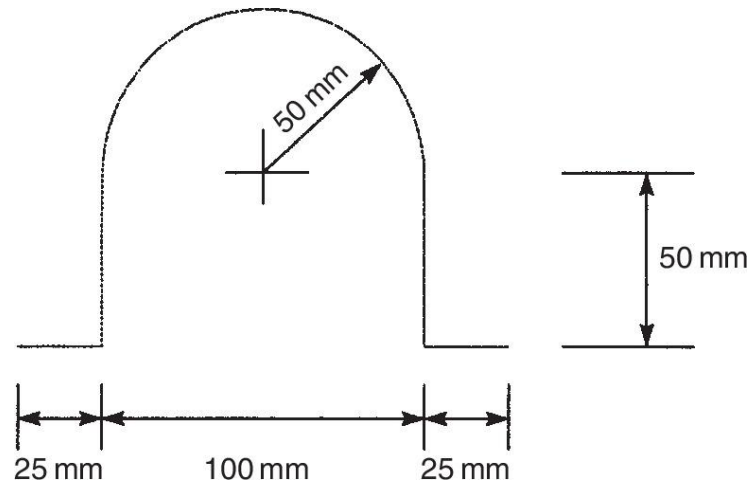
FIGURE P.17.10
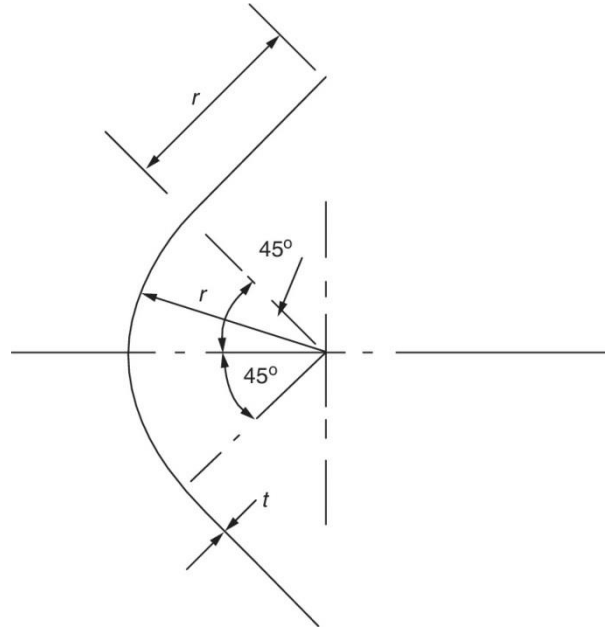
FIGURE P.17.11
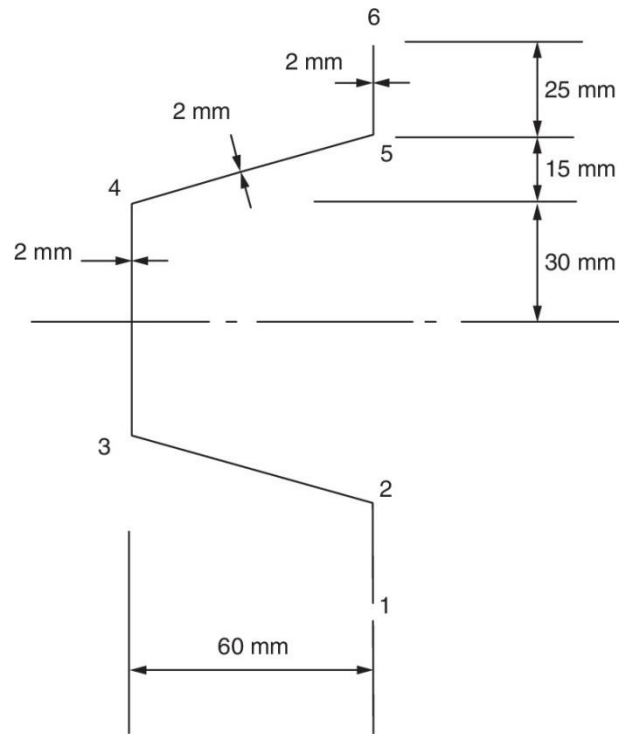
FIGURE P.17.12
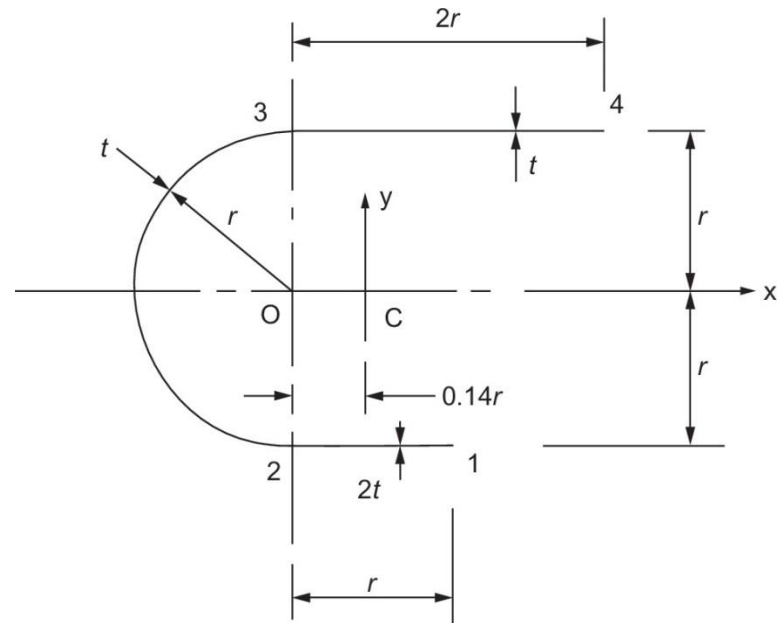
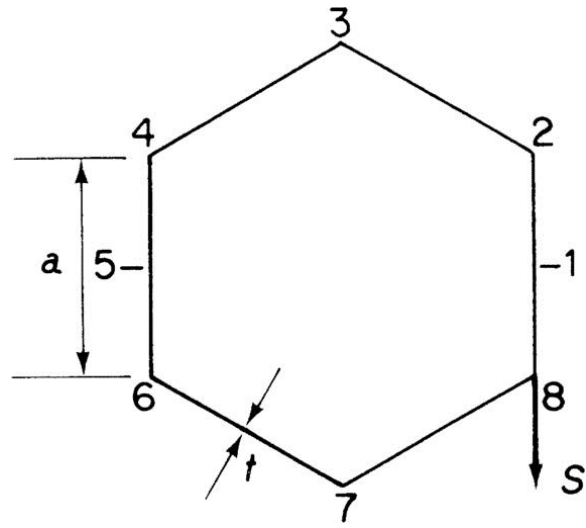**FIGURE P.17.13**
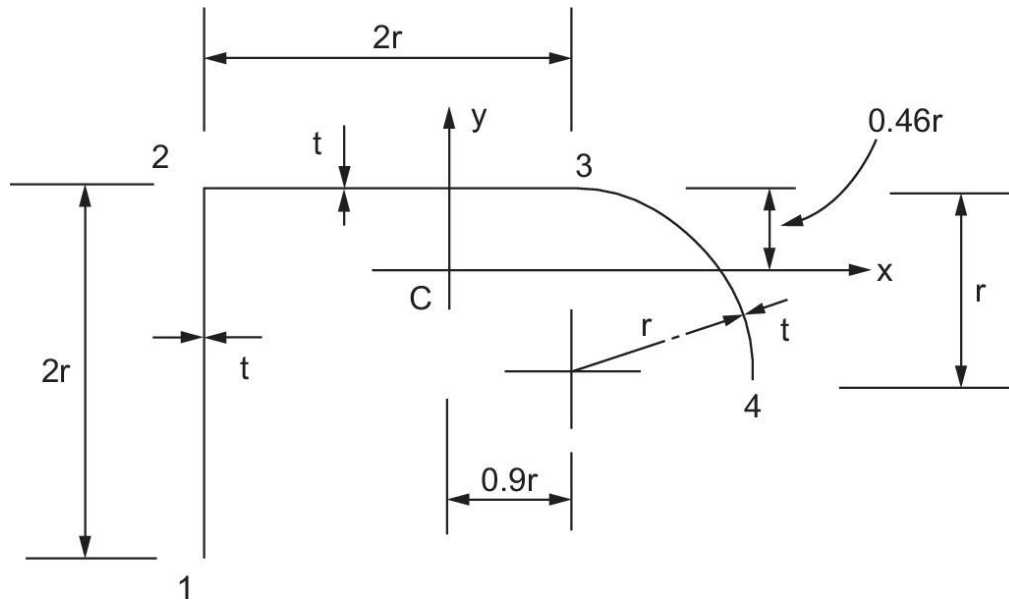
FIGURE P.17.14
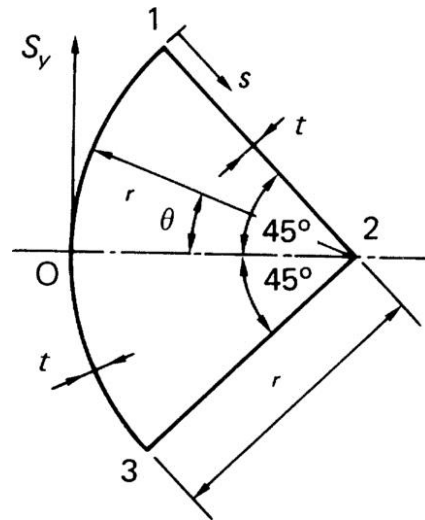
FIGURE P.17.15
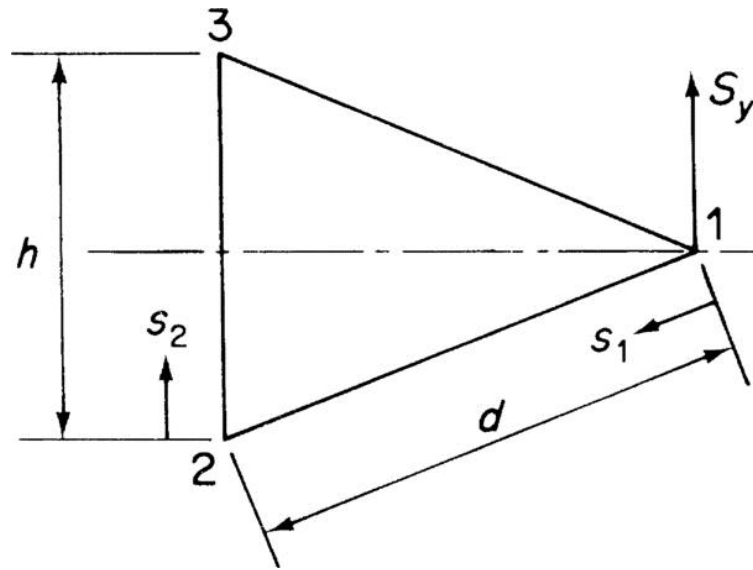
FIGURE P.17.16

FIGURE P.17.17

FIGURE P.17.18