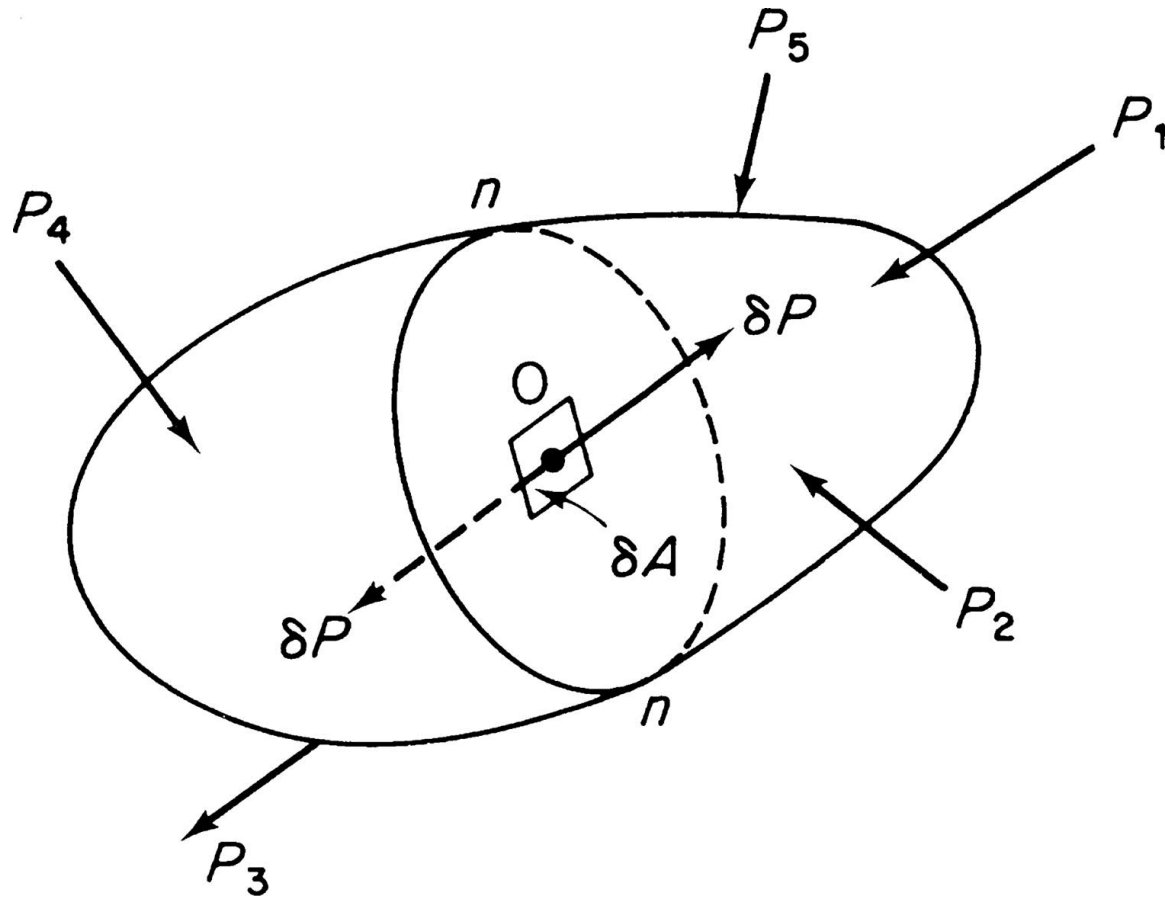
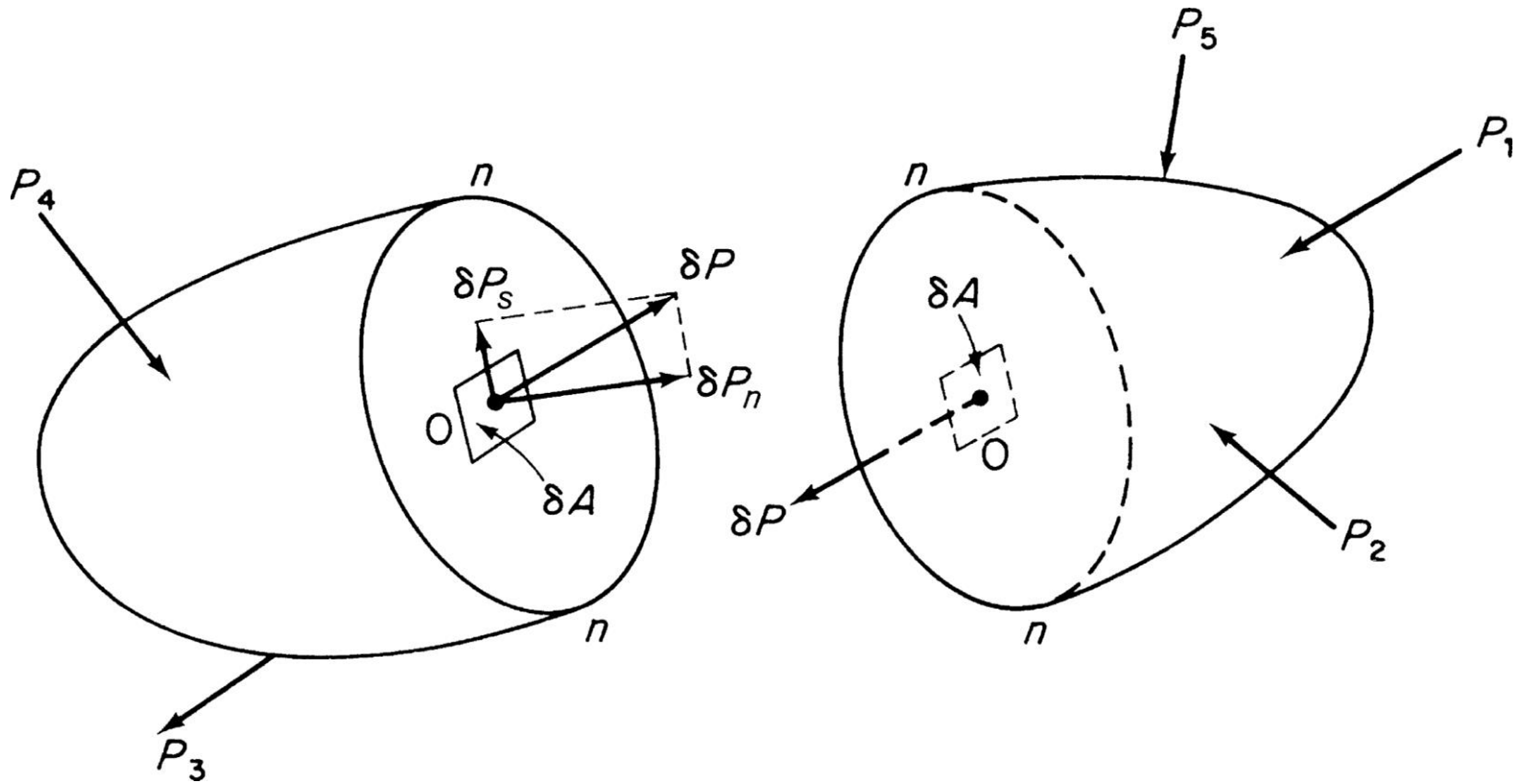


# Chapter 1

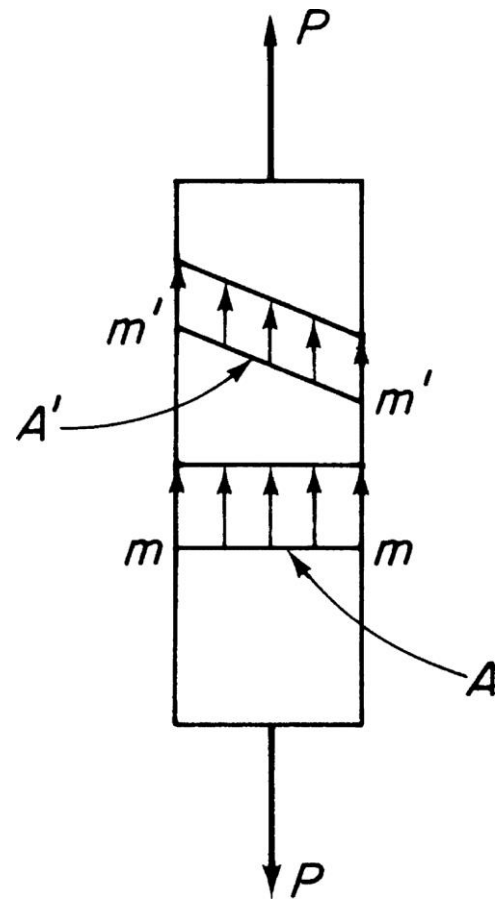
## Basic elasticity



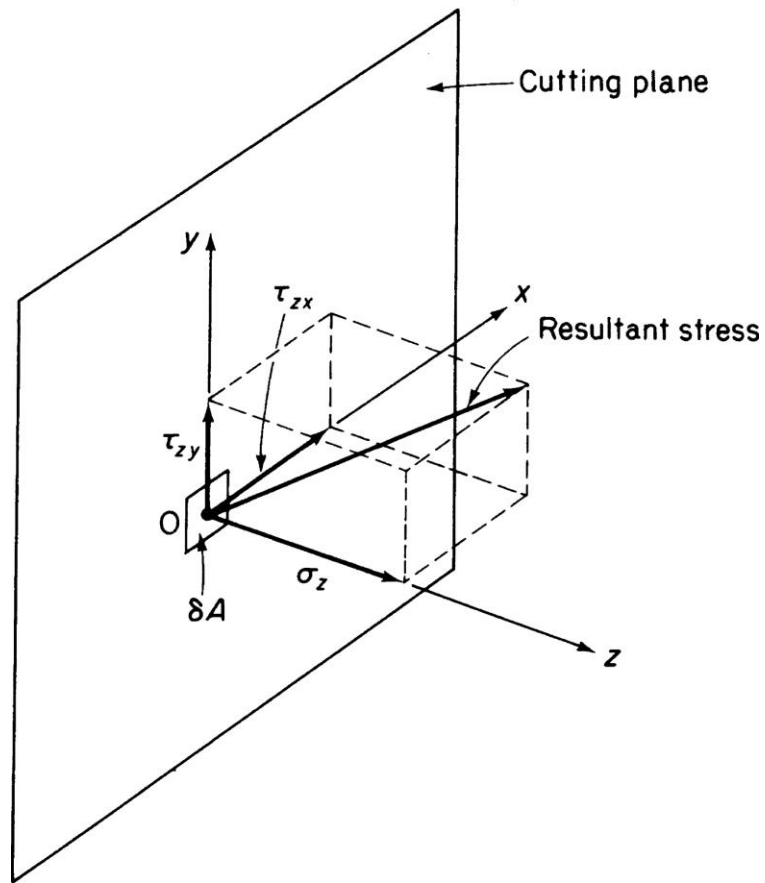
**FIGURE 1.1** Internal Force at a Point in an Arbitrarily Shaped Body



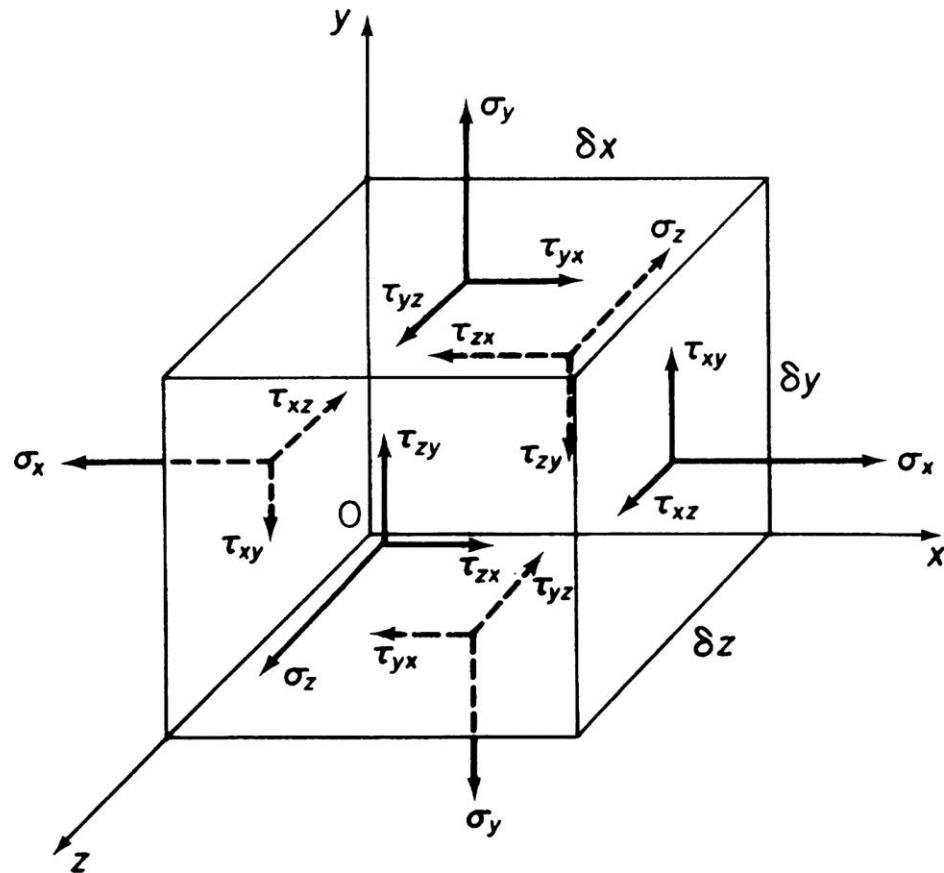
**FIGURE 1.2** Internal Force Components at the Point  $O$



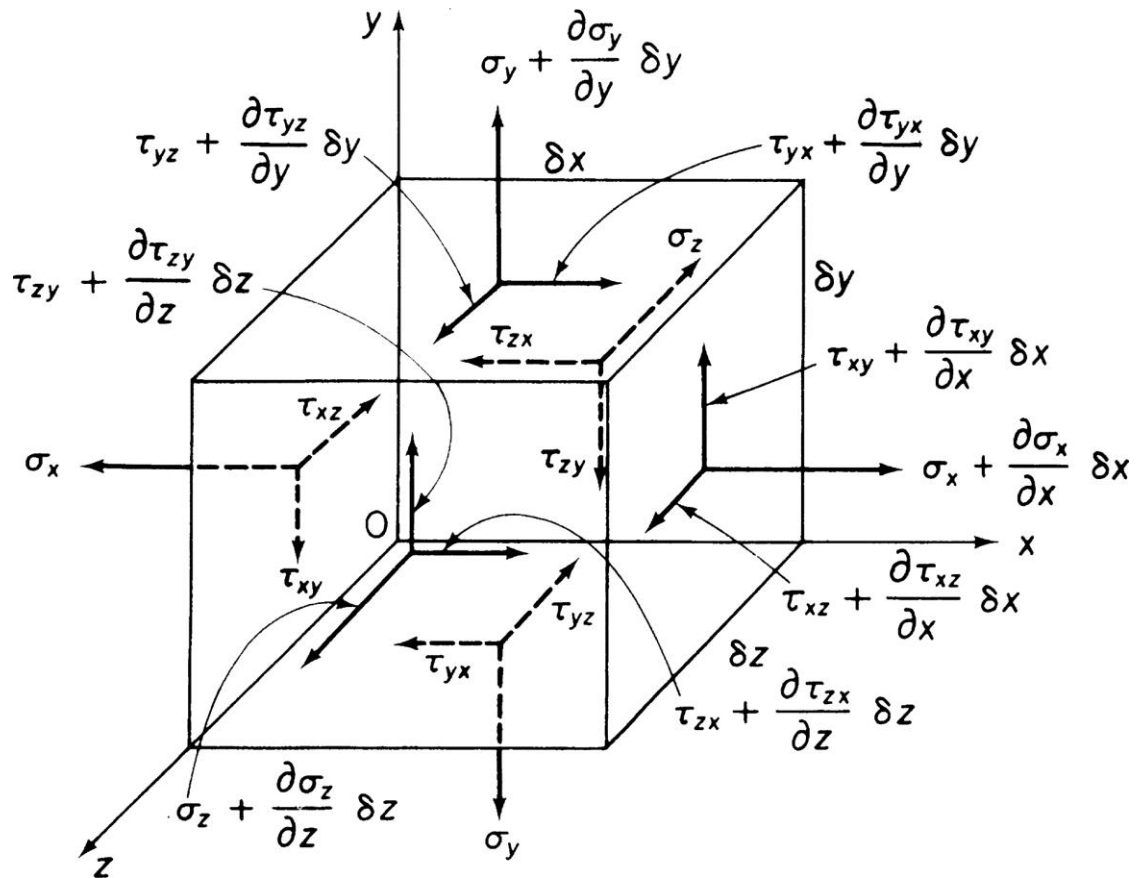
**FIGURE 1.3** Values of Stress on Different Planes in a Uniform Bar



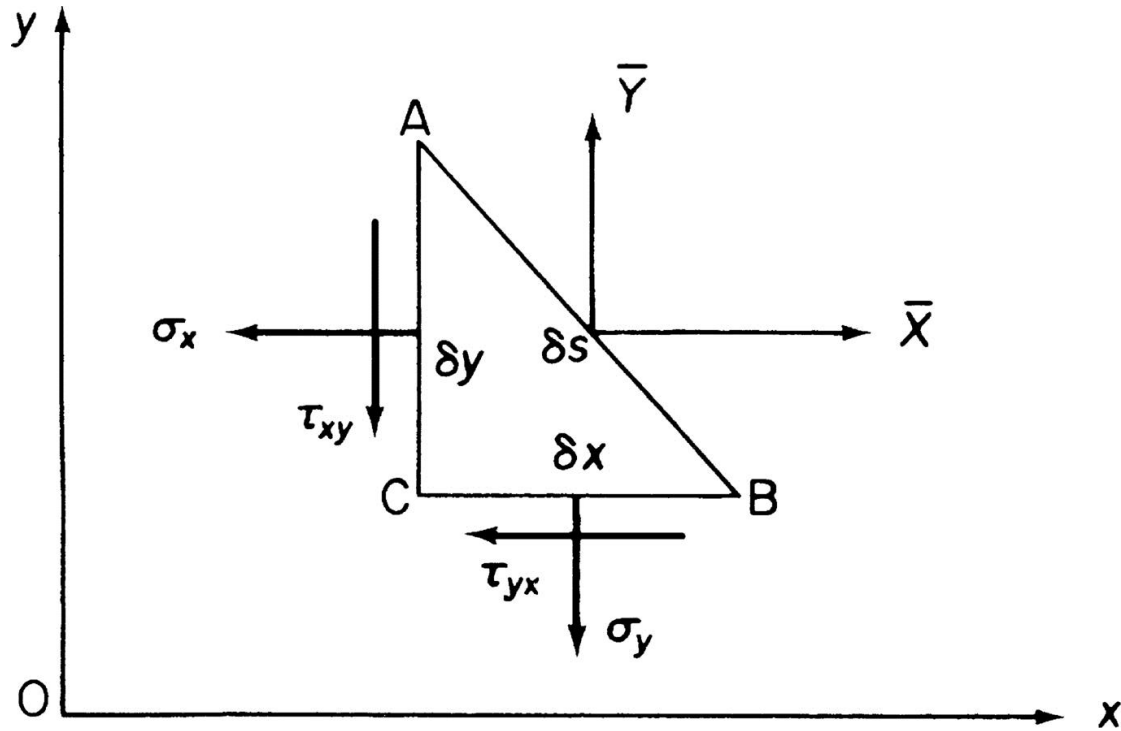
**FIGURE 1.4** Components of Stress at a Point in a Body



**FIGURE 1.5** Sign Conventions and Notation for Stresses at a Point in a Body

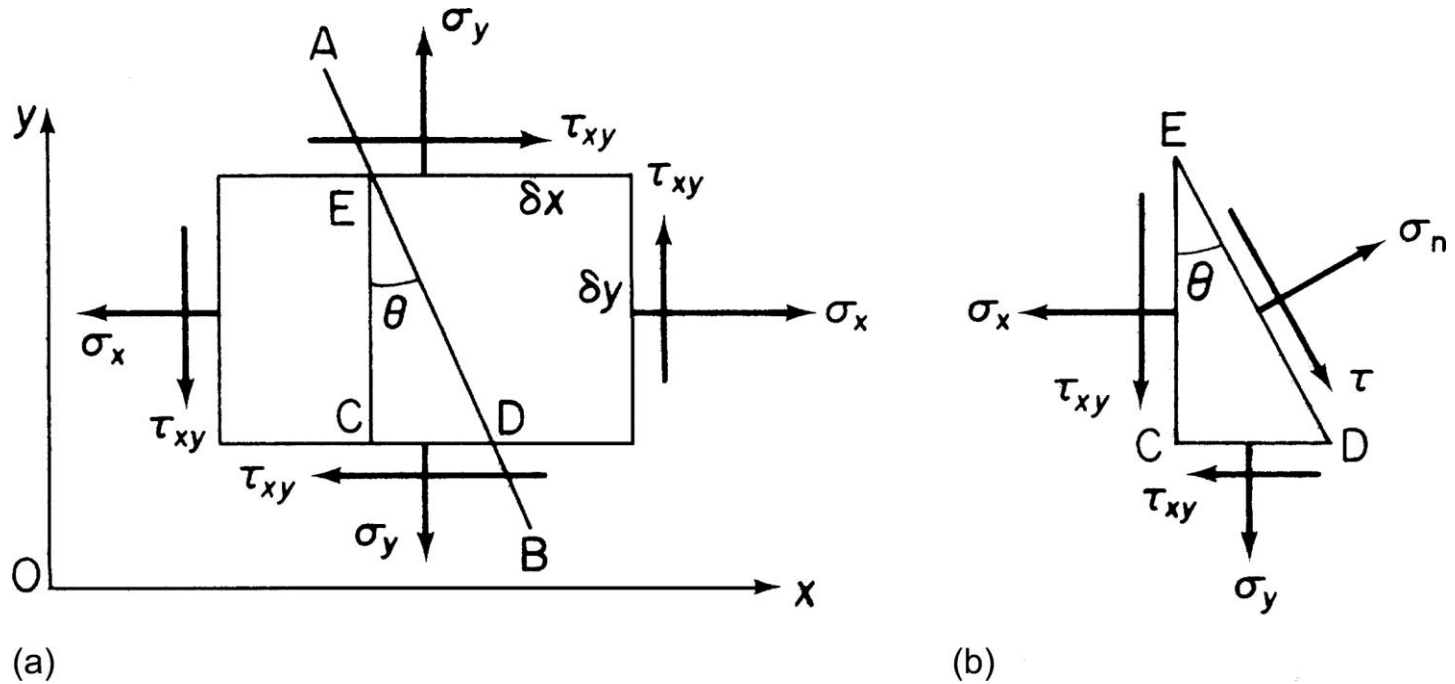


**FIGURE 1.6** Stresses on the Faces of an Element at a Point in an Elastic Body

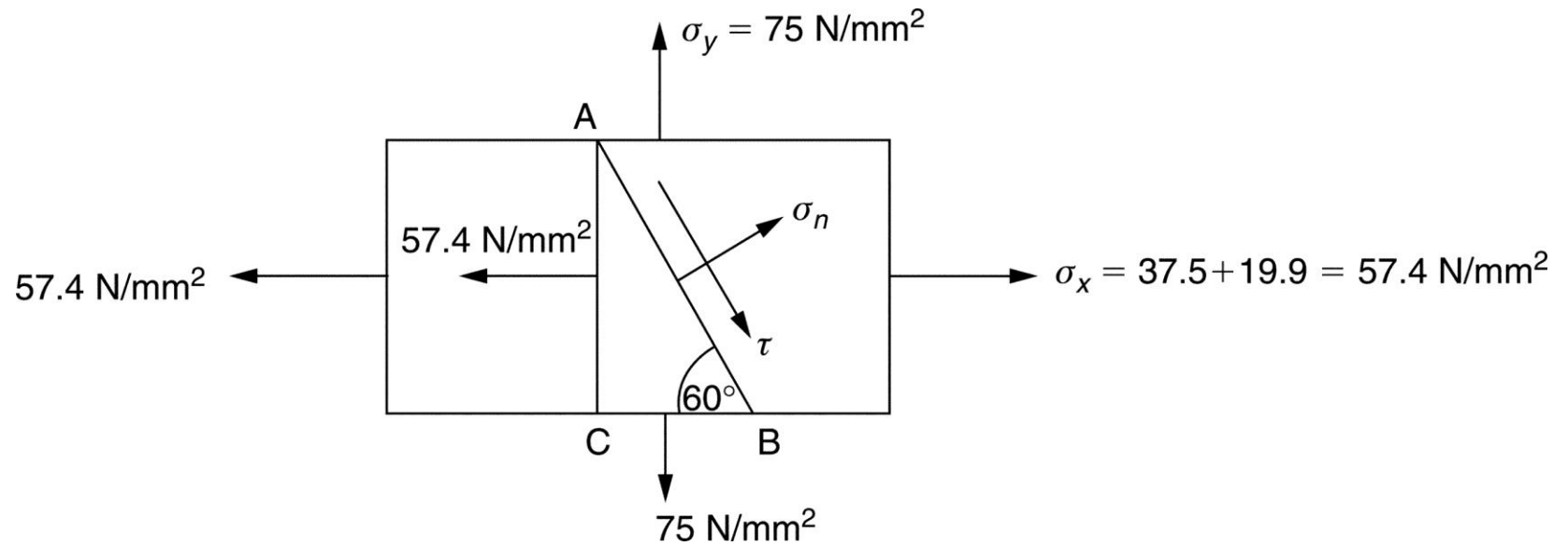


**FIGURE 1.7** Stresses on the Faces of an Element at the Boundary of a Two-Dimensional Body

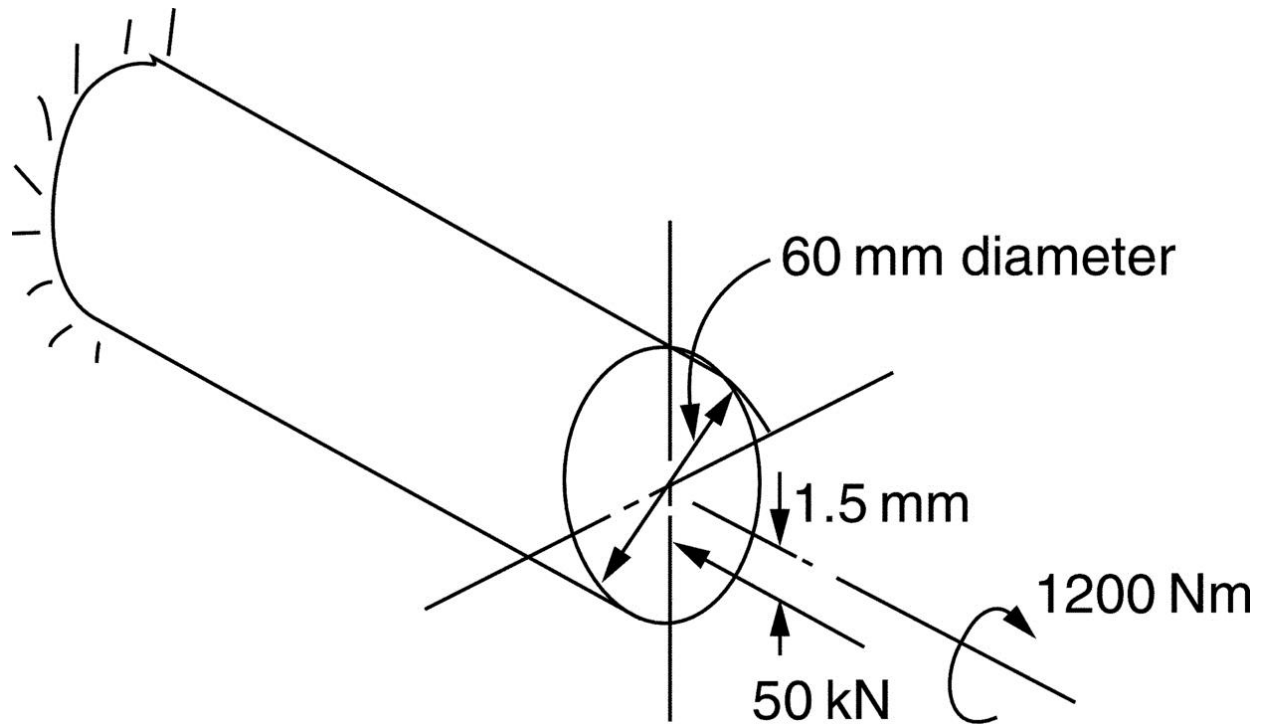




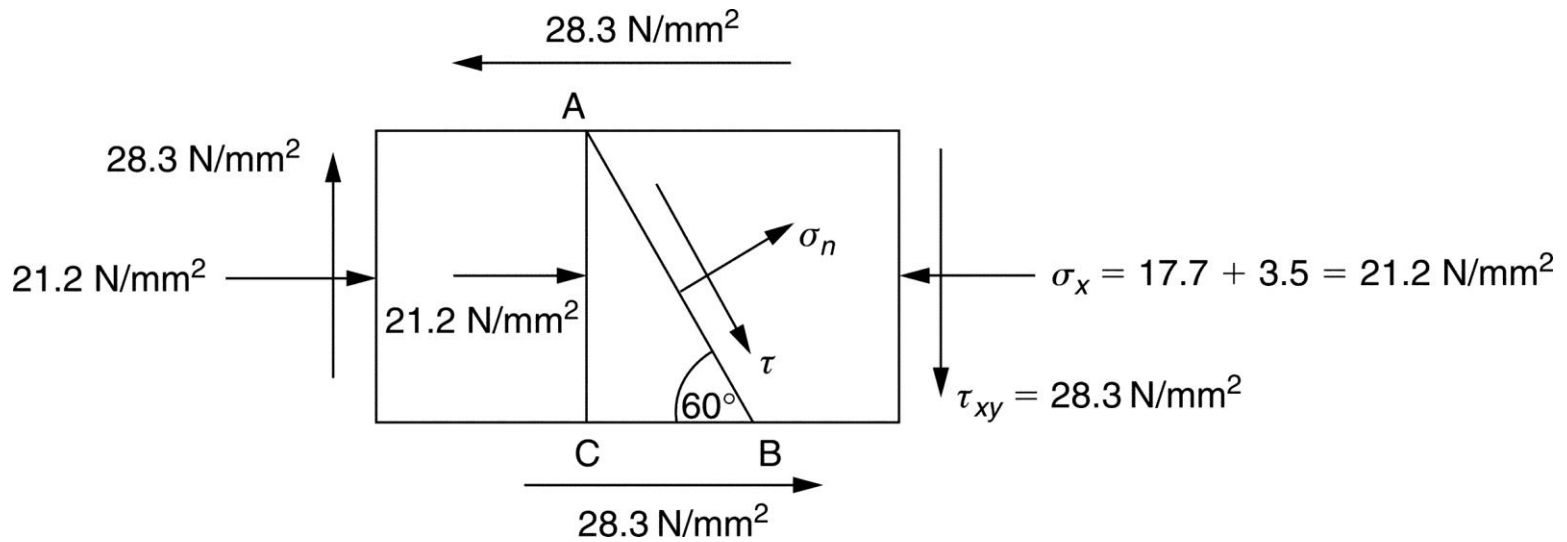
**FIGURE 1.8** (a) Stresses on a Two-Dimensional Element; (b) Stresses on an Inclined Plane at the Point



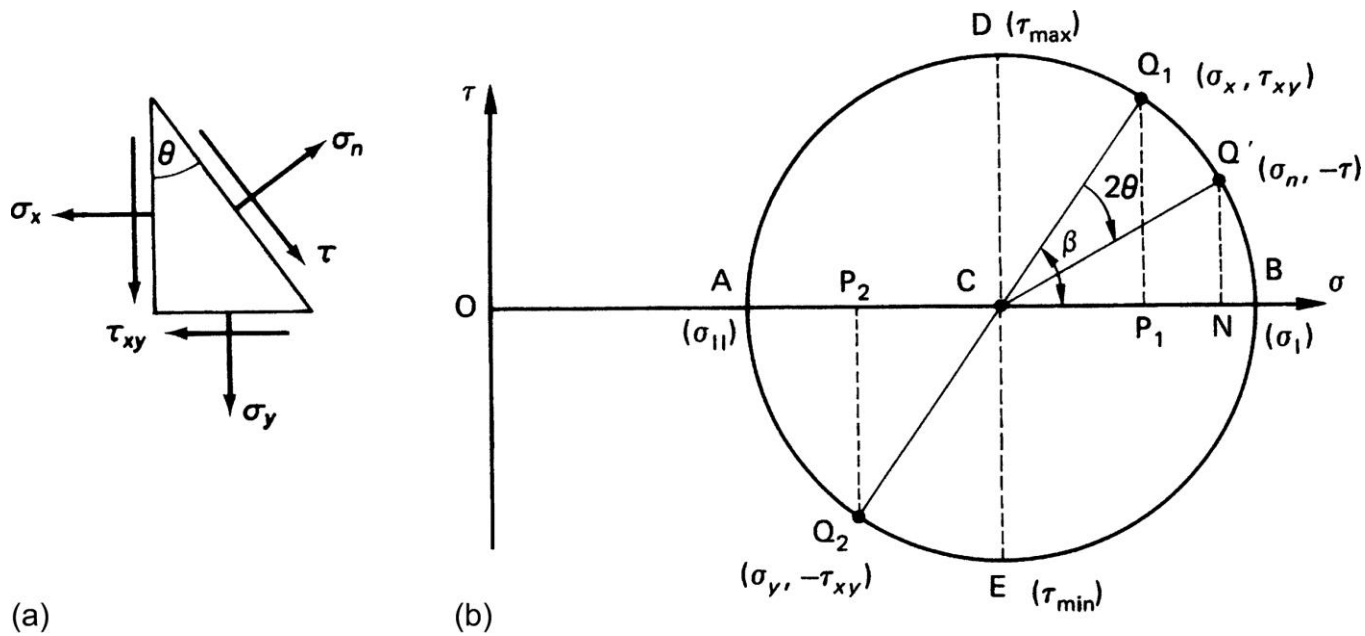
**FIGURE 1.9** Element of Example 1.1



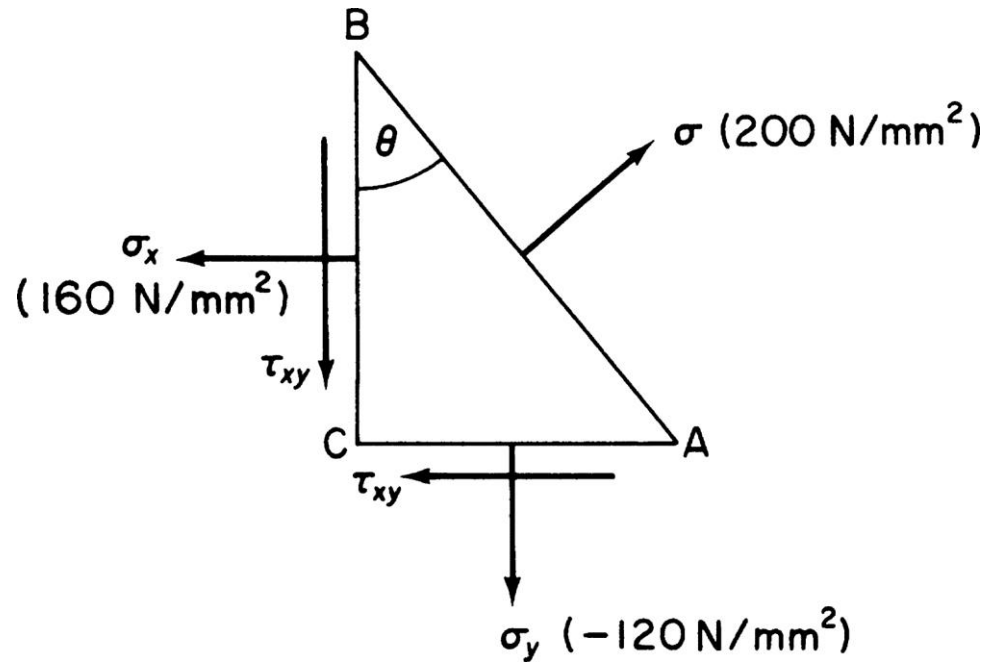
**FIGURE 1.10** Cantilever Beam of Example 1.2.



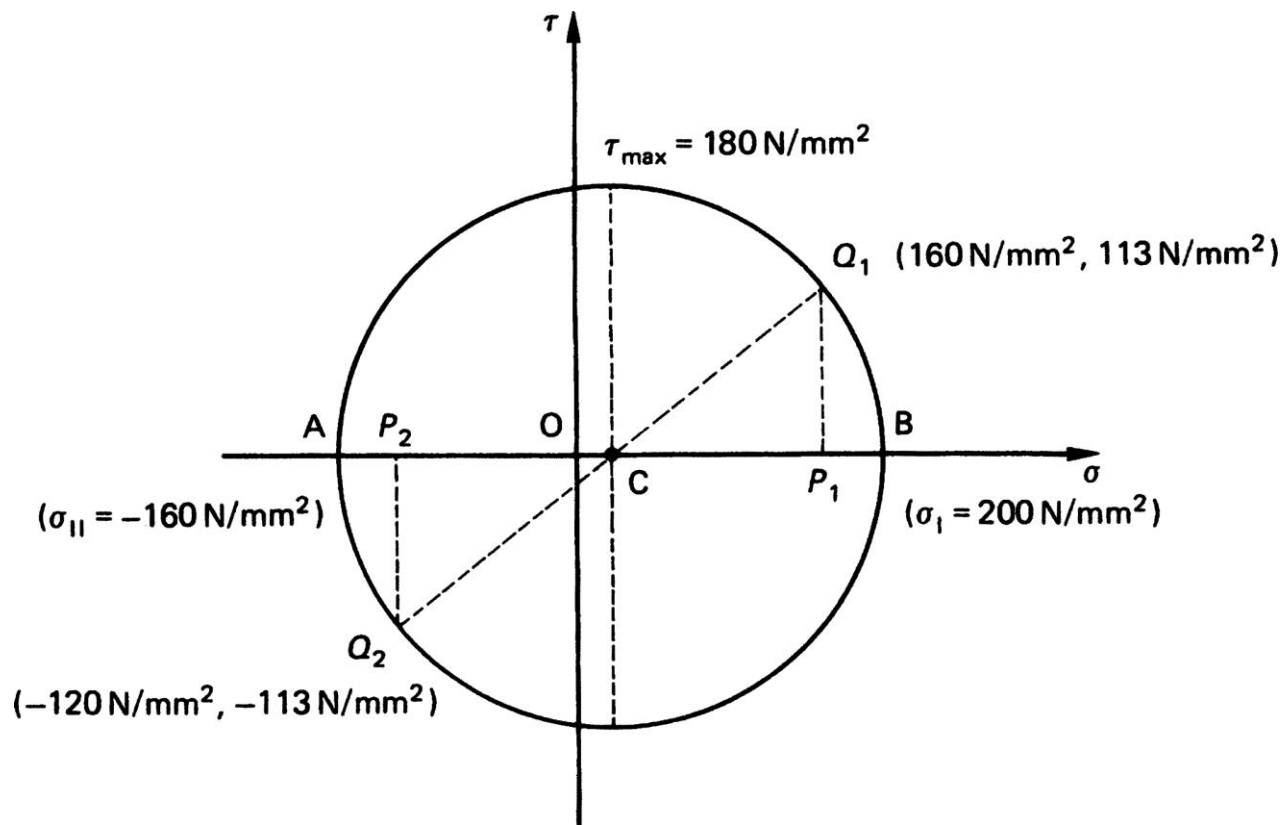
**FIGURE 1.11** Stress System on a Two-Dimensional Element of the Beam of Example 1.2



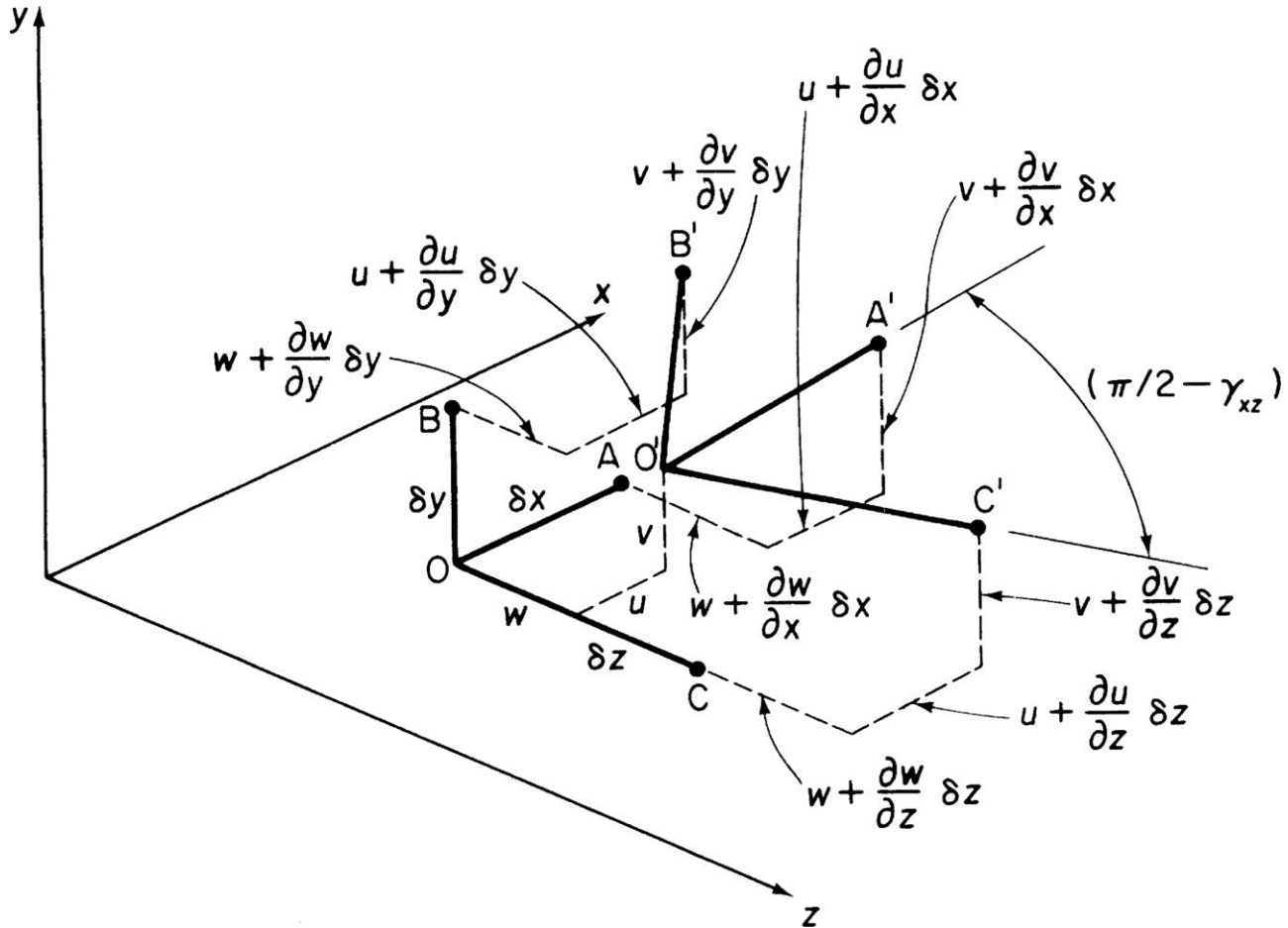
**FIGURE 1.12** (a) Stresses on a Triangular Element; (b) Mohr's Circle of Stress for the Stress System Shown in (a)



**FIGURE 1.13** Stress System for Example 1.3

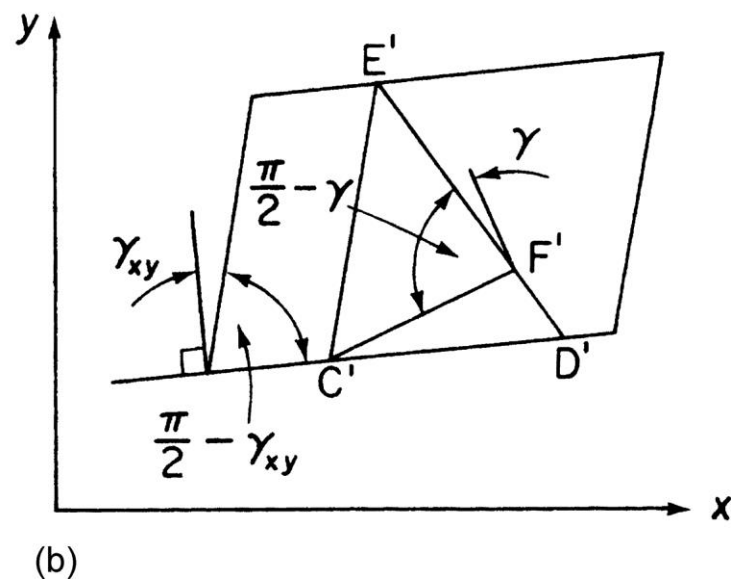
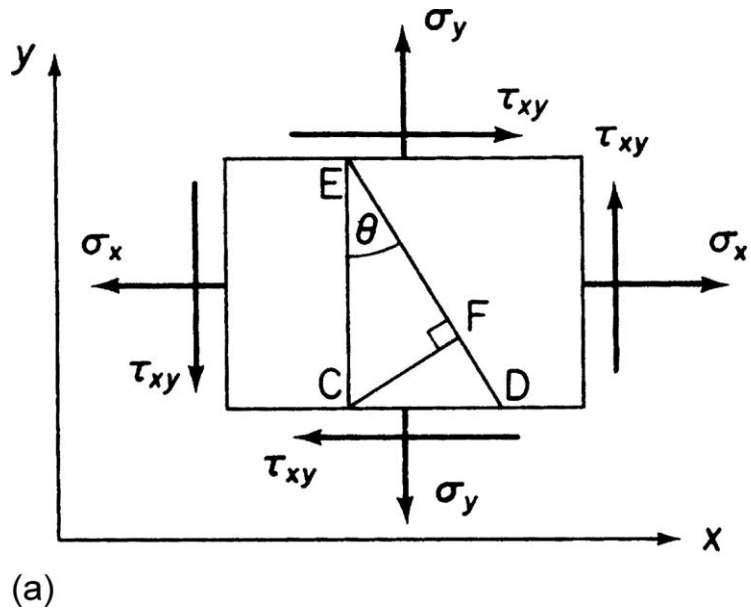


**FIGURE 1.14** Solution of Example 1.3 Using Mohr's Circle of Stress

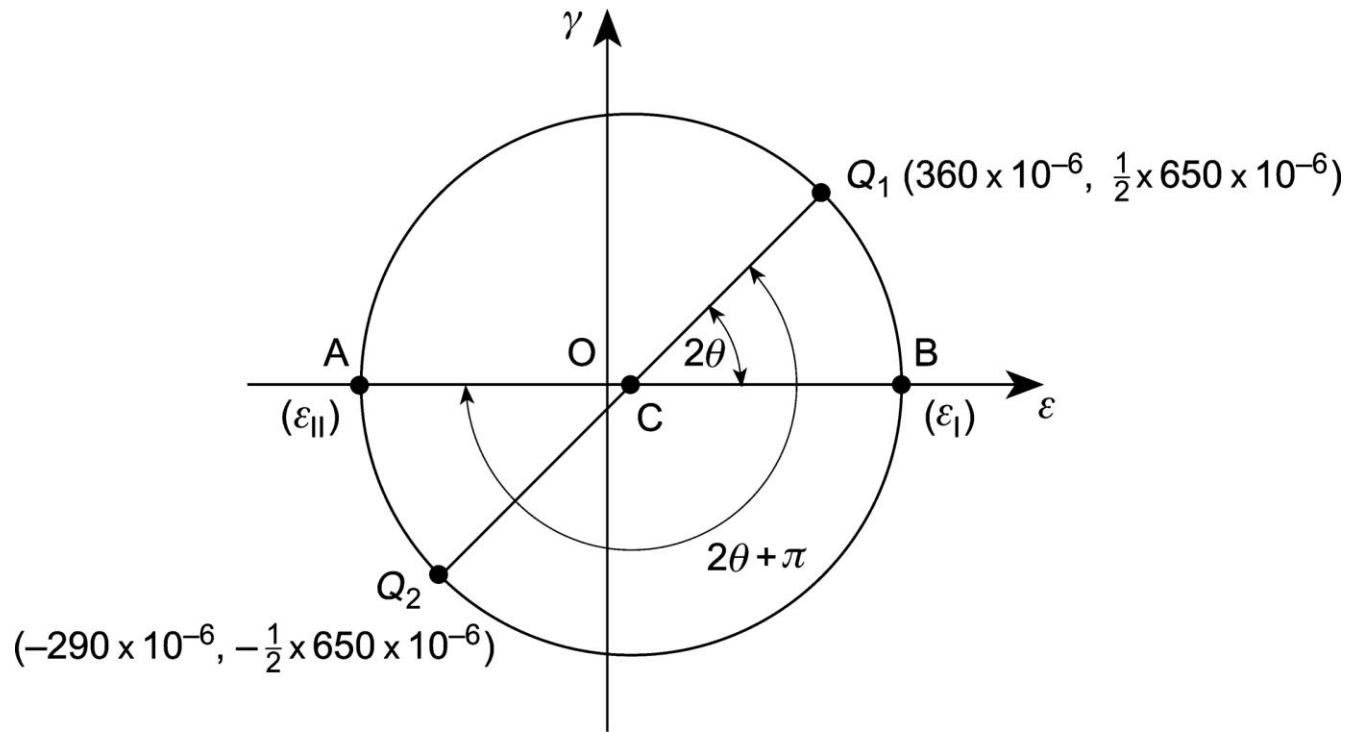


**FIGURE 1.15** Displacement of Line Elements OA, OB, and OC

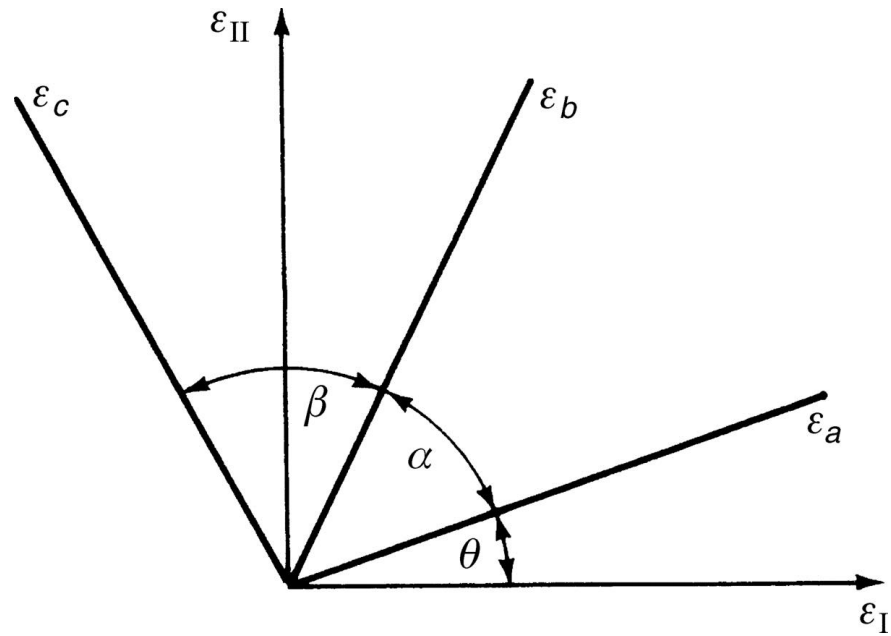




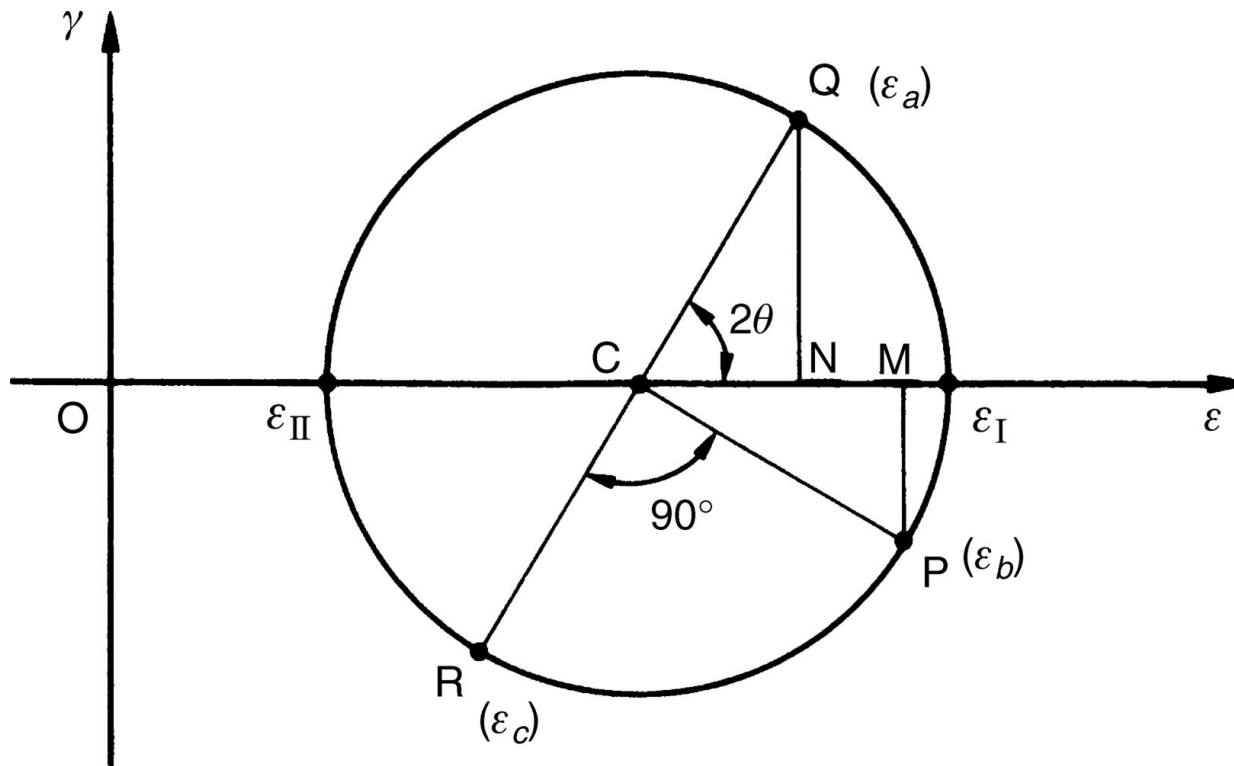
**FIGURE 1.16** (a) Stress System on a Rectangular Element; (b) Distorted Shape of the Element Due to Stress System in (a)



**FIGURE 1.17** Mohr's Circle of Strain for Example 1.5



**FIGURE 1.18** Strain Gauge Rosette



**FIGURE 1.19** Experimental Values of Principal Strain Using Mohr's Circle

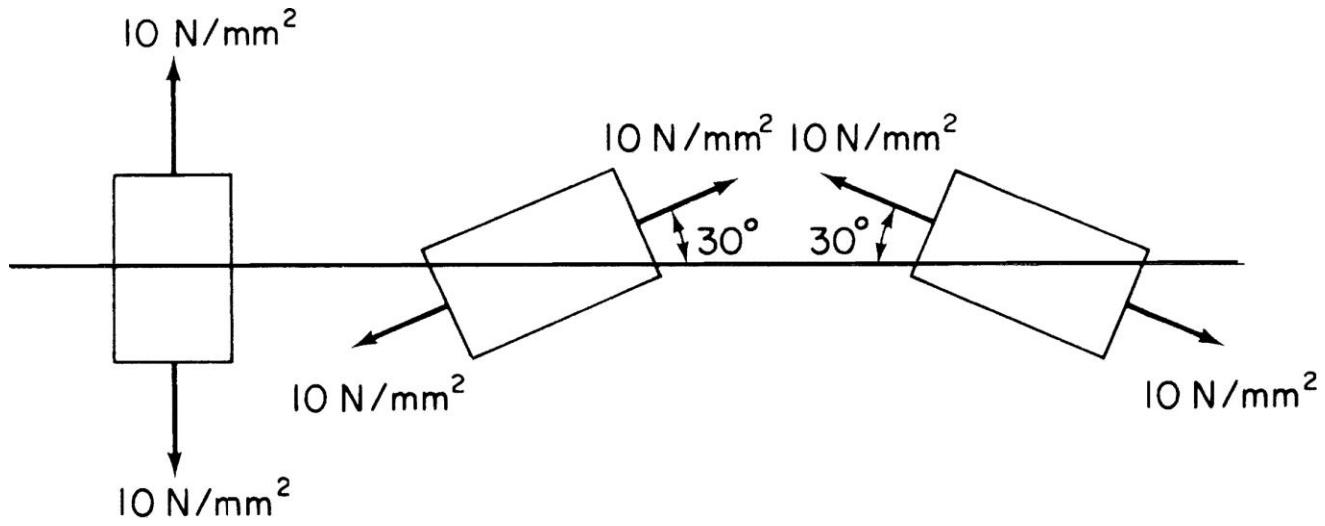


FIGURE P.1.4

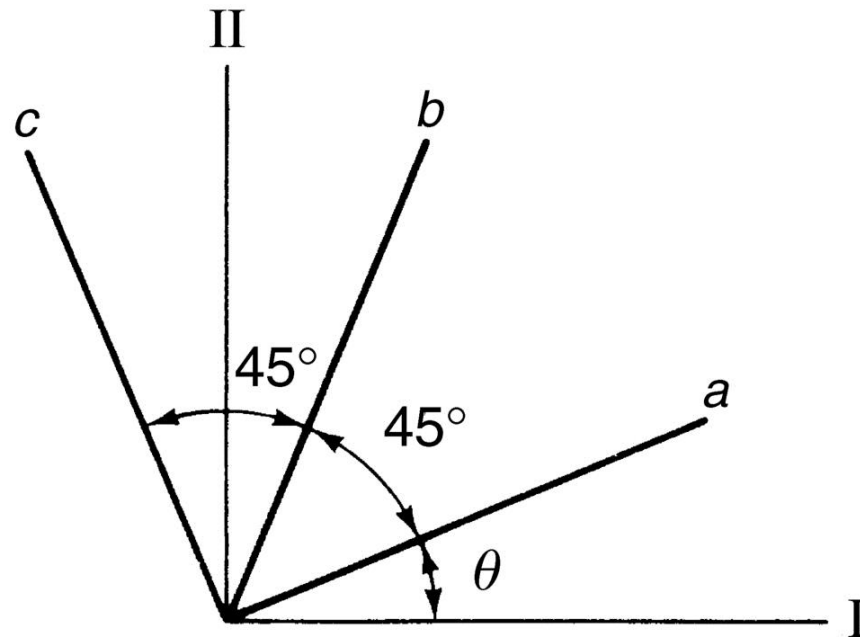


FIGURE P.1.10

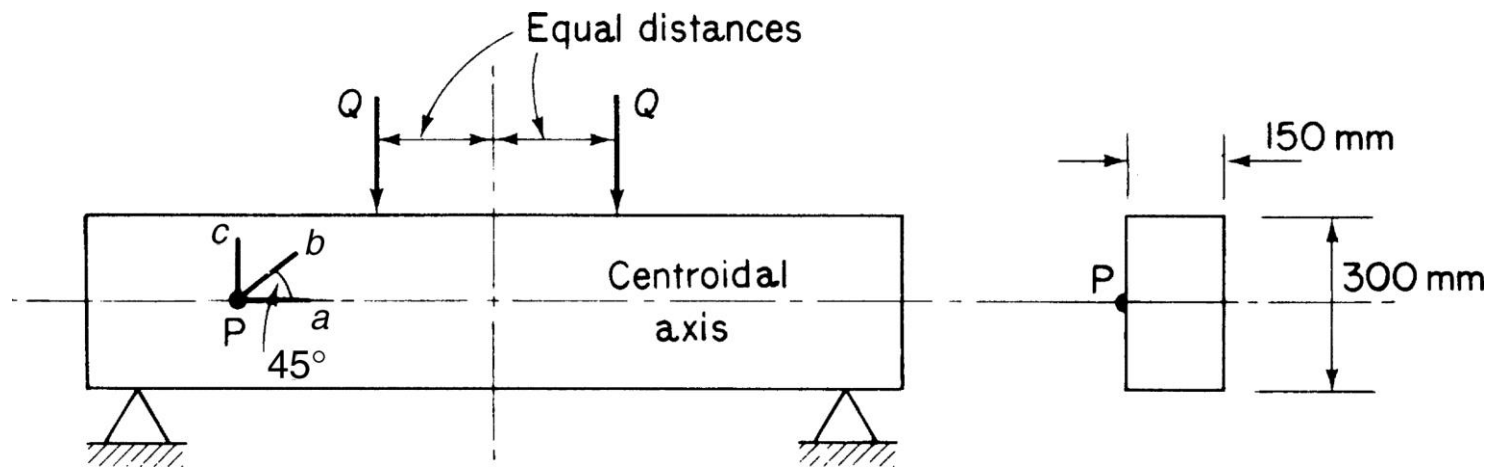


FIGURE P.1.11