

Sheet 2: Design Against Static Loads

Problem 1:

The frame of a hacksaw is shown in Fig. 1. The initial tension P in the blade should be 300 N. The frame is made of plain carbon steel with a tensile strength of 400 MPa, and the factor of safety is (2.5). The cross-section of the frame is rectangular with a ratio of depth to width as 3. Determine the dimensions of the cross-section.

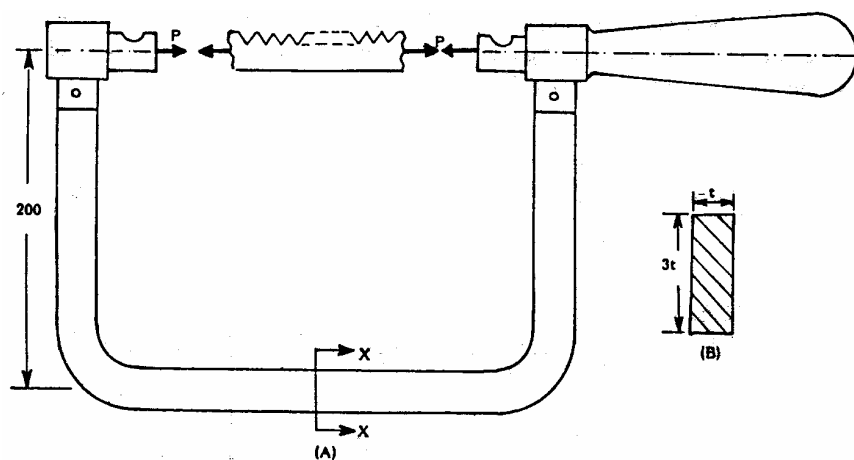


Figure 1

Problem 2:

A wall bracket with a rectangular cross-section is shown in Fig. 2. The depth of the cross-section is twice the width. The force P acting on the bracket at 60° to the vertical is 5 kN. The material of the bracket is gray cast iron with an ultimate tensile strength of 200 MPa. The factor of safety is (3.5). Determine the dimensions of the cross-section of the bracket.

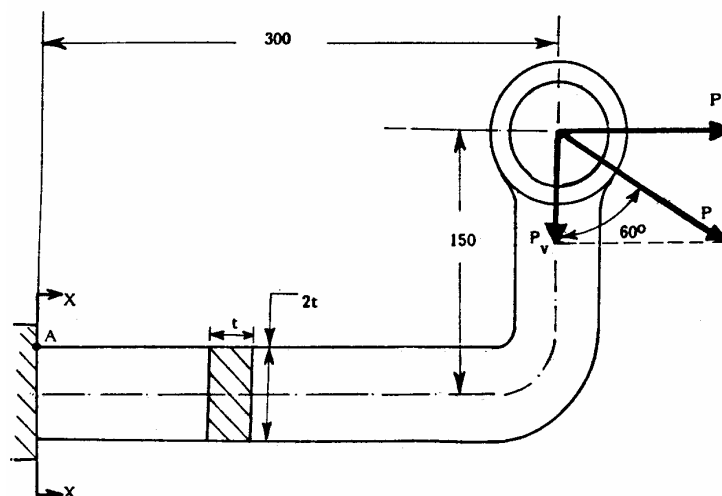


Figure 2

Dimensions are in mm