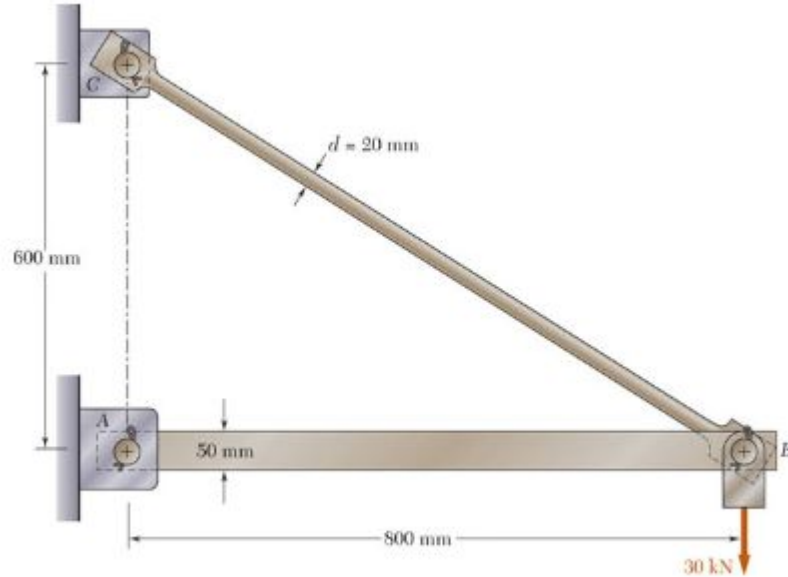# Introduction

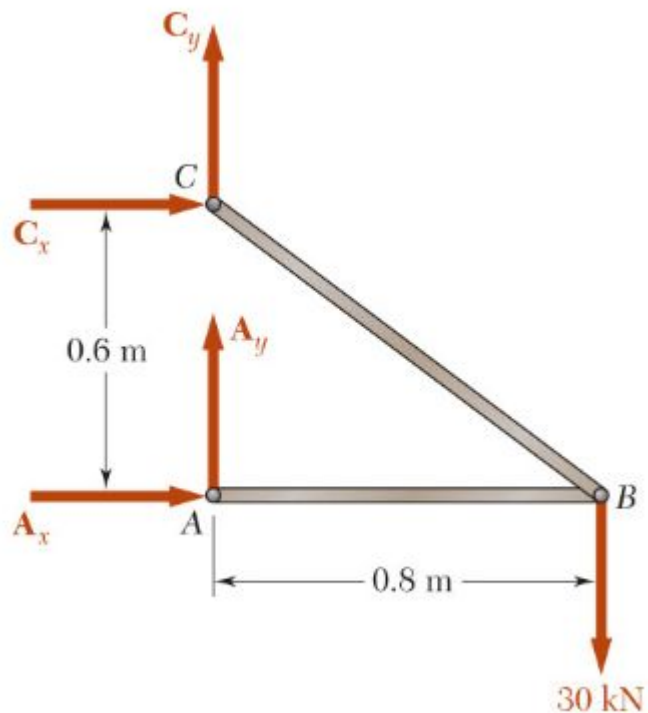Mechanics of Materials-Chapter 1
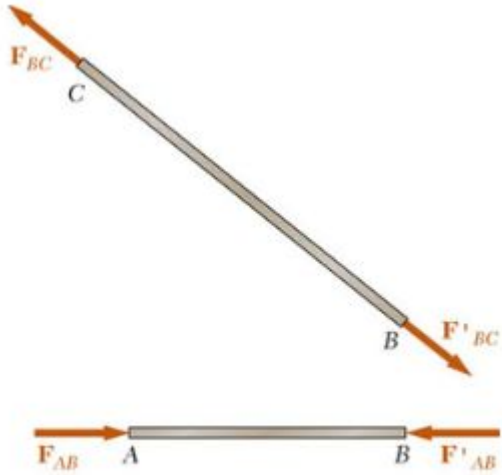Beer, Johnston, Dewolf, Mazurek

Background

Let us consider the structure where a rod and a boom are designed to support a 30 kN load. AB has a cross section of 30x50. Diameter of BC is 20 mm. The boom and the rod are connected by a pin at B, and pin and bracket at A and C.
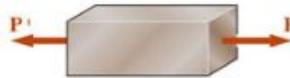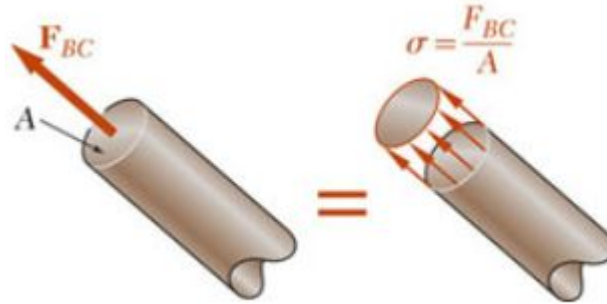
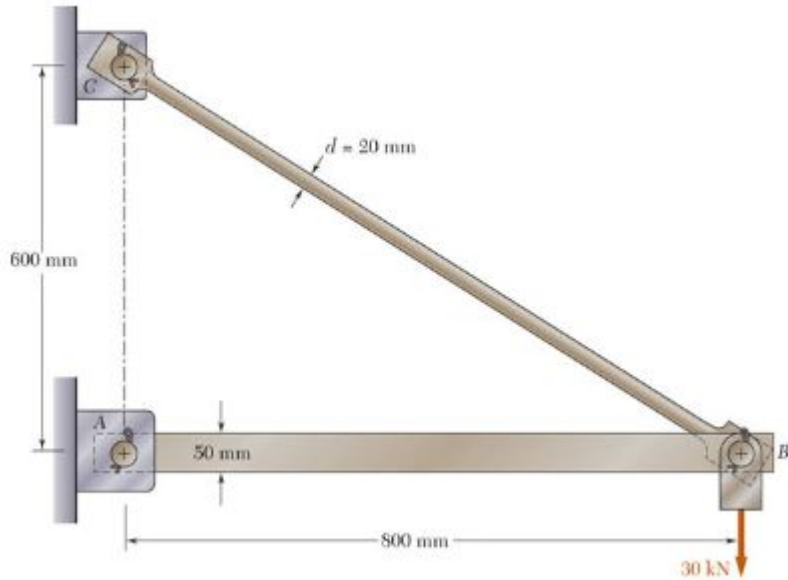Determine the reactions at A & C.
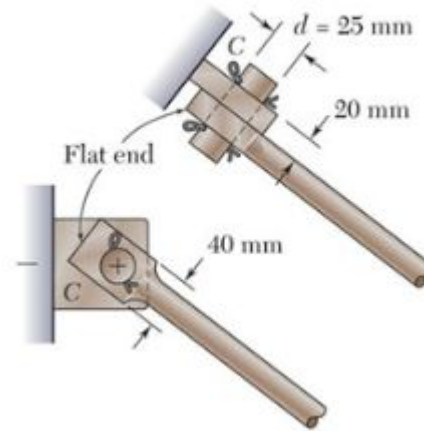
Example

Force in members

Concept of stress

$$\sigma = \frac{F_{BC}}{A}$$

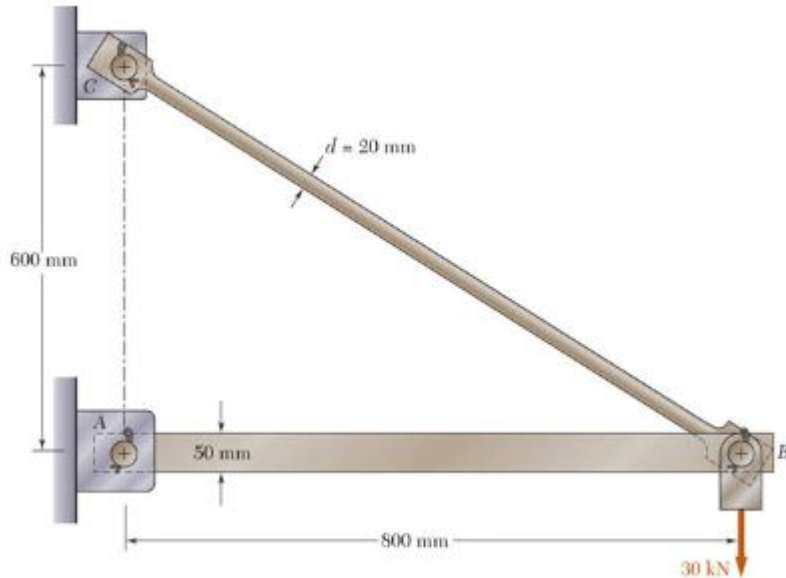$d = 20$ mm

600 mm

50 mm
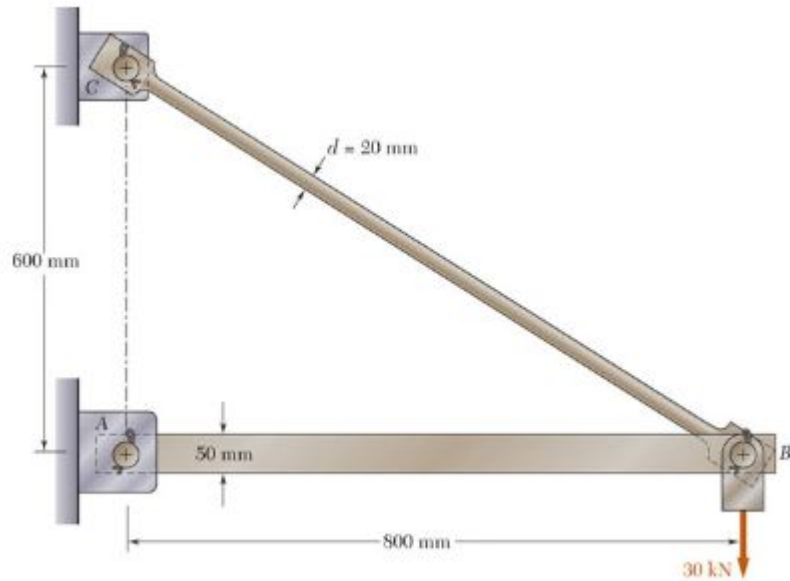
800 mm

30 kN

F_{BC}

A

P'

P

Concept of stress

Rod BC has flat ends of 20 x 40-mm rectangular cross section

Design!

The word "stress" is introduced!