NOTE: Only problems 4.19 and 4.30 will be marked.

Problem 1 (Problem 3.154)

A 110-N force acting in a vertical plane parallel to the *yz* plane is applied to the 220-mm-long horizontal handle *AB* of a socket wrench. Replace the force with an equivalent force-couple system at the origin *O* of the coordinate system.

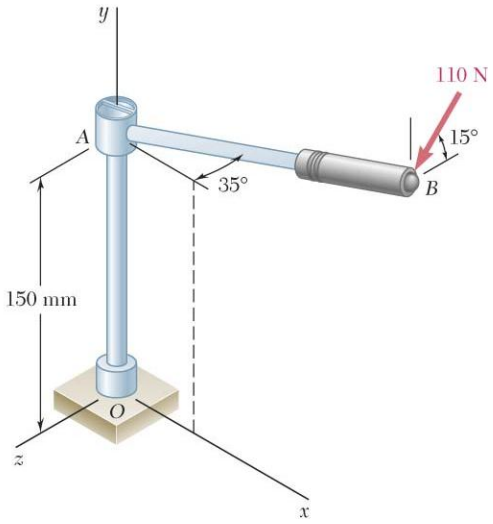

Fig. 1

Problem 2 (Problem 4.7)

A T-shaped bracket supports the four loads shown. Determine the reactions at *A* and *B*:

(a) if $a = 10$ cm,

(b) if $a = 7$ cm.

Neglect the weight of the bracket.

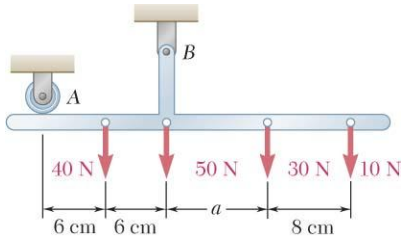

Fig. 2

Problem 3 (Problem 4.19)

The bracket *BCD* is hinged at *C* and attached to a control cable at *B*. For the loading shown, determine:

(a) the tension in the cable,

(b) the reaction at *C*.

Neglect the weight of the bracket.

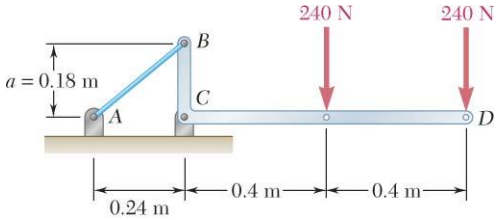

Fig. 3

Problem 4 (Problem 4.22)

For the frame and loading shown, determine the reactions at *A* and *E* when:

(a) $\alpha = 30^\circ$,

(b) $\alpha = 45^\circ$. Neglect the weight of the frame.

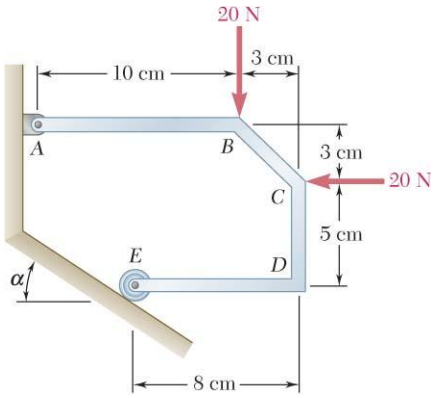

Fig. 4

Problem 5 (Problem 4.30)

Neglecting the friction, determine the tension in cable *ABD* and the reaction at support *C*.

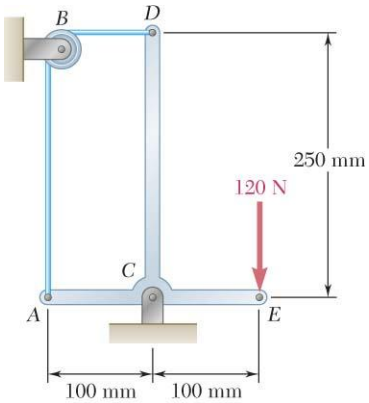

Fig. 5