工程力學

Exam. # 1 (10/30/2017)

1. (10pts) Two cables are tied together at C and loaded are shown in Fig. 1. Determine the tension (a) in cable AC, (b) in cable BC.

2. (20pts) A rectangular plate is supported by three cables as shown in Fig. 2. Knowing that the tension in the cable AC is 60N, determine the weight of the plate.

3. (20pts) To lift a heavy crate, a man uses a block and tackle (滑輪組) attached to the bottom of an I-beam at hook B as shown in Fig. 3. Knowing that the man applies a 195-N force to end A of the rope and that the moment of that force about the y axis is 132 N·m, determine the distance a.

4. (20pts) A 500-N force is applied to a bent plate as shown in Fig. 4. Determine (a) an equivalent force- couple system at B, (b) an equivalent system formed by a vertical force at A and a force at B.

5. (10pts) A couple of magnitude $M = 0.54$ N·m and the three forces shown in Fig. 5 are applied to an angle bracket. (a) Find the resultant of this system of forces. (b) Locate the points where the line of action of the resultant intersects line AB and line BC.

6. (20pts) Three children are standing on a 5 × 5-m raft (木筏) shown in Fig. 6. If the weights of the children at points A, B, and C are 375 N, 260 N, and 400 N, respectively, determine the magnitude and the point of application of the resultant of the three weights.

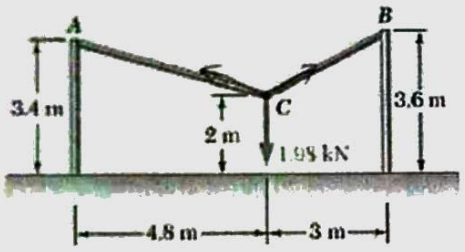
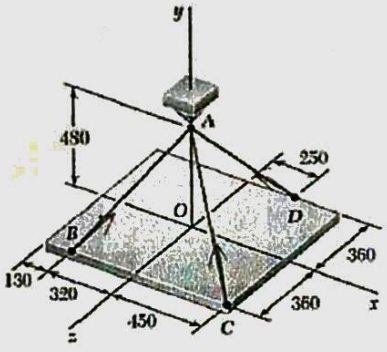


Fig. 1



Dimensions in mm

Fig. 2

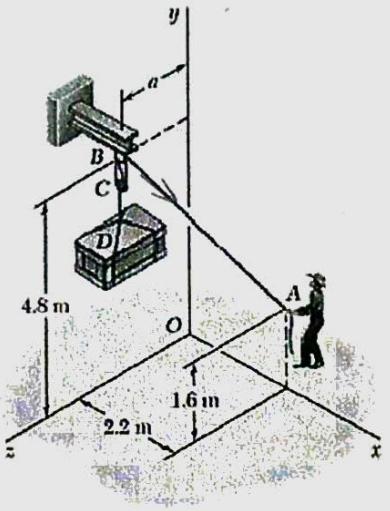


Fig. 3

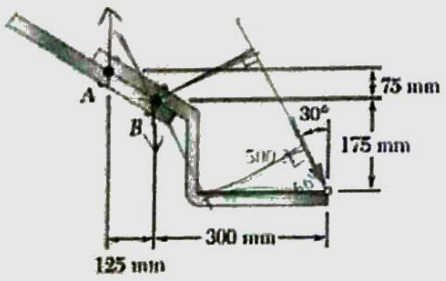


Fig. 4

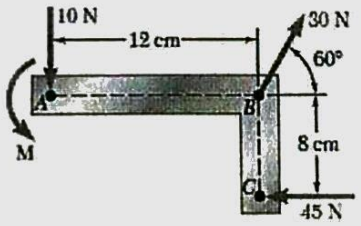


Fig. 5

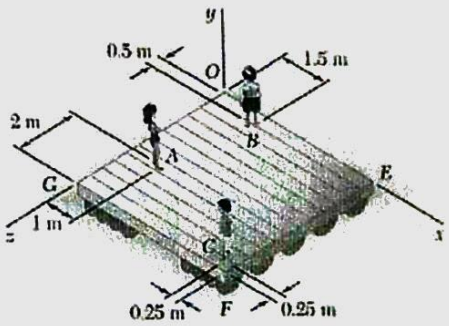


Fig. 6