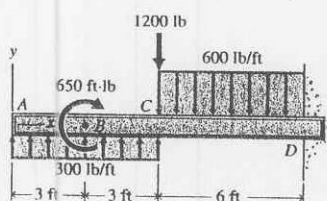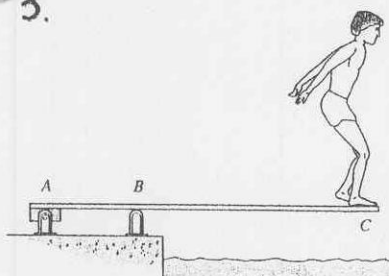1. A beam is loaded and supported as shown in **Fig. 1**. Draw complete shear and moment diagrams for the beam. (25%)

2. A cable supports two vertical loads as shown in **Fig. 2**. If the maximum tension in the cable is 1000 lb, determine (25%)

    (a) The horizontal and vertical components of the reactions at supports A and D. (10%)

    (b) The vertical distances y_B and y_C. (10%)

    (c) The length L of the cable. (5%)

3. A boy with a mass of 60 kg is standing on a 40×300 mm wood (E=10 GPa) diving board, as shown in **Fig. 3**. If length AB is 0.6 m and length BC is 1.5 m, determine the maximum deflection in the diving board. (25%)

4. The soccer ball shown in **Fig. 4** weighs 1 lb and has a velocity of 20 ft/s at $40°$ to the horizontal prior to striking the soccer player's head. After the soccer player hits the ball, it has a velocity of 30 ft/s at $20°$ to the horizontal. If the duration of the impact is 0.15 s, determine the average force exerted on the soccer ball by the soccer player's head. (25%)
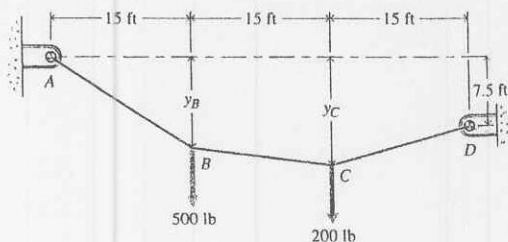

試題隨卷繳回