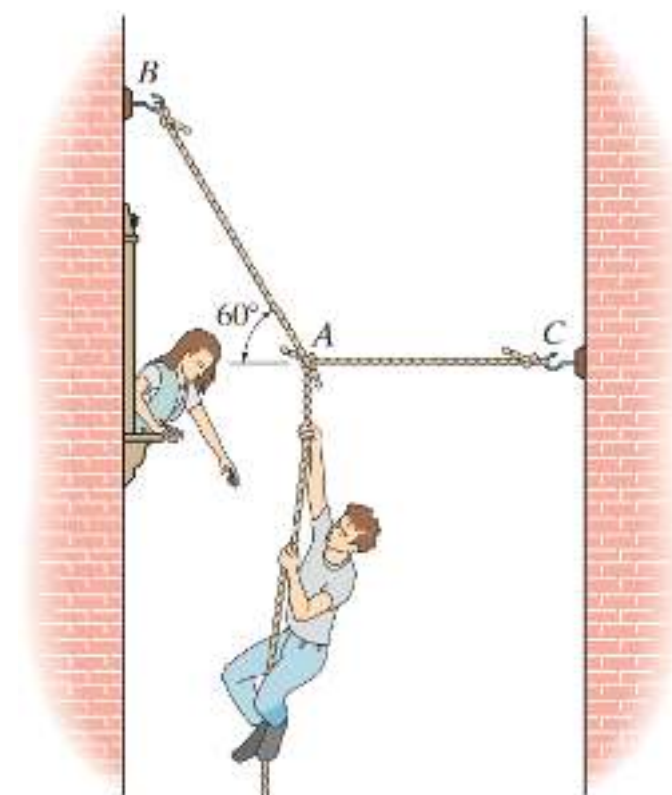
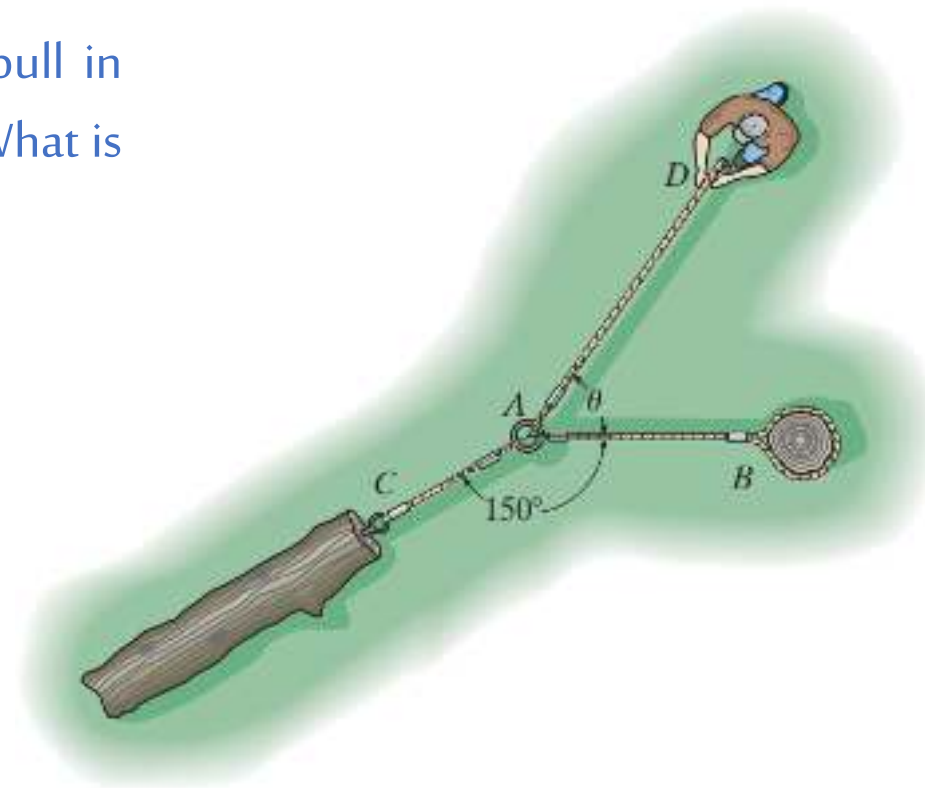


Romeo tries to reach Juliet by climbing with constant velocity up a rope which is knotted at point A . Any of the three segments of the rope can sustain a maximum force of 2 kN before it breaks.

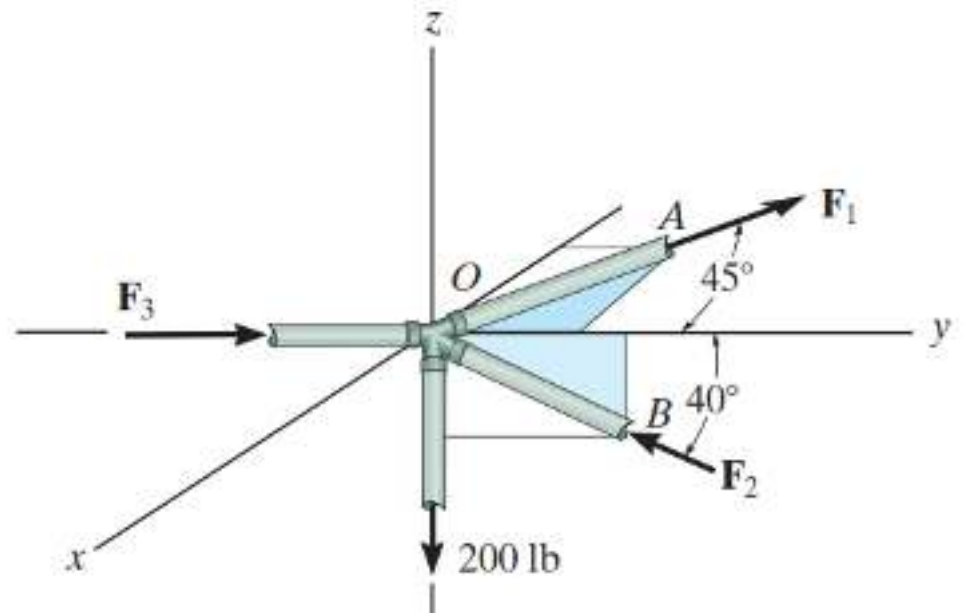
Determine if Romeo, who has a mass of 65 kg, can climb the rope, and if so, can he along with Juliet, who has a mass of 60 kg, climb down with constant velocity?



- The man attempts to pull the log at C by using the three ropes.
- (1) Determine the direction θ in which he should pull on his rope with a force of 500 kN, so that he exerts a maximum force on the log. What is the force on the log for this case?
 - (2) Also, determine the direction in which he should pull in order to maximize the force in the rope attached to B . What is this maximum force?



The joint of a space frame is subjected to four member forces. Member OA lies in the $x - y$ plane and member OB lies in the $y - z$ plane. Determine the forces acting in each of the members required for equilibrium of the joint.



(1) The lamp has a mass of 15 kg and is supported by a pole AO and cables AB and AC . If the force in the pole acts along its axis, determine the forces in AO , AB , and AC for equilibrium.

(2) If Cables AB and AC can sustain a maximum tension of 500 N, and the pole can support a maximum compression of 300 N. Determine the maximum weight of the lamp that can be supported in the position shown.

