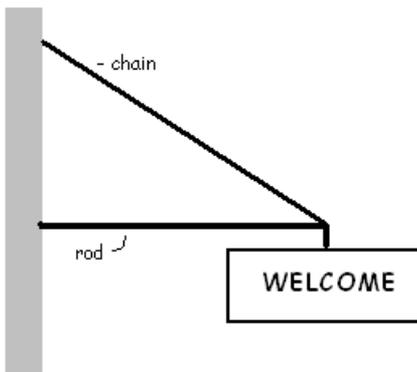# EQUILIBRANT FORCES

1. Three people attempt to haul a heavy sign to the roof of a building by using three ropes attached to the sign. Abby stands directly above the sign and pulls straight up on a rope. Eric and Kim stand on either side of Abby. Their ropes form 30.0° angles with Abby's rope. A force of 102 N is applied on each rope. What does the sign weigh? *(279 N)*

2. An object in equilibrium has three forces exerted on it. A 33 N force acts due north, and a 44 N force acts at 60.0° N of E. What is the magnitude and direction of the third force? *(74 N, 73° S of W)*

3. A street lamp weighs 150 N. It is supported equally by two wires that form an angle of 120° with each other. What is the tension in each wire? *(150 N)*

4. A person weighing 612 N sits in the middle of a hammock that is 3.0 m long and sags 1.0 m below the points of support. If the maximum force the hammock ropes can support is 445 N, will the hammock hold? *(460 N in each rope – CRASH!)*

5. Bob has attached a sign that has a weight of 495 N to a wall outside his store, as shown in the diagram below *(35° angle)*. Determine (a) the tension in chain and (b) the thrust force exerted by the rod. *(a - 863 N;   b – 707 N)*

- chain

rod

WELCOME

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