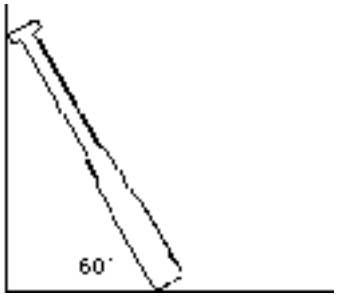
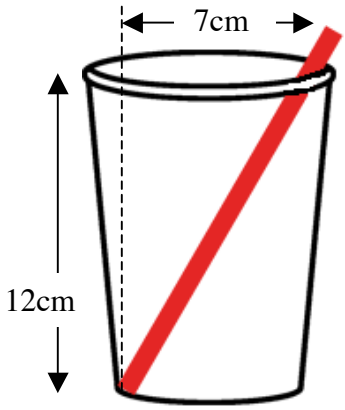
1. An 80.0cm long 120cm high shopping cart has wheels near each end. It is filled with pumpkins so it has a mass of 45.0kg. The center-of-mass is in the middle of the cart. The front wheel is stuck against the curb. Find the maximum horizontal force he can exert before the cart begins to rotate forward.

2. A baseball bat leans against a smooth wall making a 60° angle with the ground. The center of mass is two-thirds of the way down the bat. Find the minimum coefficient of static friction needed to keep the bat in place.



3. A 5.00g straw is just long enough to rest across a drinking glass that is 7.00cm wide and 12.0cm tall, as shown. Assume the top of the glass is smooth and rounded. Find the magnitude and direction of the force that the bottom of the cup exerts on the straw.



4. A hungry bear weighing 700N walks out on a beam in an attempt to retrieve a basket of food hanging at the end. The beam is uniform, weights 200N, and is 6.00m long. The basket weighs 80.0N. When the bear is at x=2.00m, find the tension in the wire and the components of the force exerted by the wall on the beam.