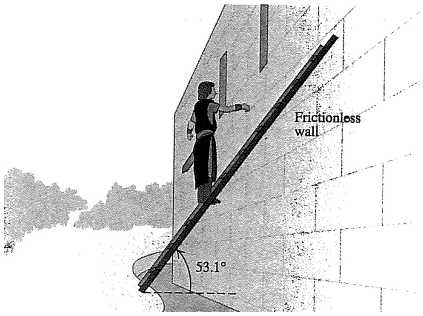
AP Physics

Worksheet 01a – Torque

Sir Lancelot is trying to rescue the Lady Elayne from Castle Von Doom by climbing a uniform ladder that is 5.0 m long and weighs 180 N. Lancelot, who weighs 800 N, stops a third of a way up the ladder. The bottom of the ladder rests on a horizontal stone ledge and leans across the moat in equilibrium against a vertical wall that is frictionless because of a thick layer of slippery moss. The ladder conveniently makes an angle of 53.1° with the horizontal (a 3-4-5 triangle).



Find the normal and friction forces on the ladder at its base.

Find the minimum coefficient of static friction needed to prevent slipping at the base.

Find the magnitude and direction of the contact force on the ladder at the base.