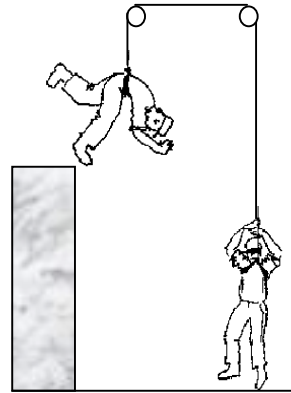


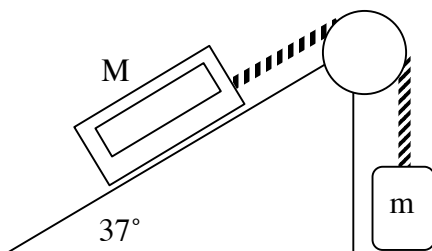
1. A 70.0kg painter hoists himself upward using the rope and pulley system shown at the right. At some point while working his way upward, his acceleration is  $1.50\text{m/s}^2$ . Find the tension in the rope at this time.



2. Two acrobats are tied together at opposite ends of a rope that is held up with pulleys. The 65.0kg acrobat begins to fall downward by stepping off the top of a 5.00m high wall. The 55.0kg acrobat on the ground begins to rise. Find their acceleration.



3. Below is a picture of a funicular railway. The effort needed to move the car up and down the track can be greatly reduced if the car uses a cable connected to a large mass that drops from the top of the hill as shown in the sketch below. Assuming that there is no friction, find the ratio between the mass of the car and the falling mass such that they counter balance each other.



A funicular railway in Switzerland

4. A 5.00kg box rests on top of a 7.00 kg box as shown at the right. They are connected to each other via the pulley shown. The coefficient of friction between the two boxes and between the boxes and the floor is 0.300. Find the force that needs to be exerted on the rope at the bottom right to make the system move.

