

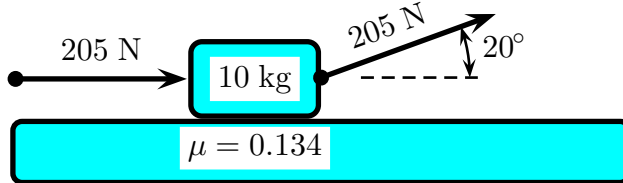
This print-out should have 5 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

Forces Accelerating a Block

001 10.0 points

The magnitude of each force is 205 N, the force on the right is applied at an angle 20° and the mass of the block is 10 kg. The coefficient of friction is 0.134.

The acceleration of gravity is 9.8 m/s^2 .



What is the magnitude of the resulting acceleration?

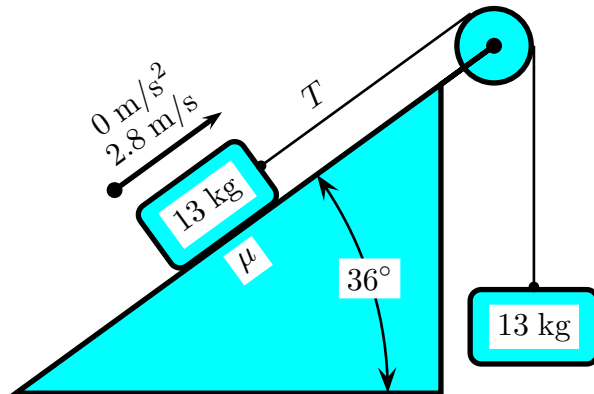
Correct answer: 39.39 m/s^2 .

Two Blocks 01

002 (part 1 of 2) 10.0 points

Two blocks are attached by a thin inextensible string over a frictionless, massless pulley. There is a frictional force between the block on the incline and the incline.

The acceleration of gravity is 9.8 m/s^2 .



Calculate the magnitude of the frictional force acting on the block on the incline.

Correct answer: 52.5162 N.

003 (part 2 of 2) 10.0 points

Calculate the coefficient of friction.

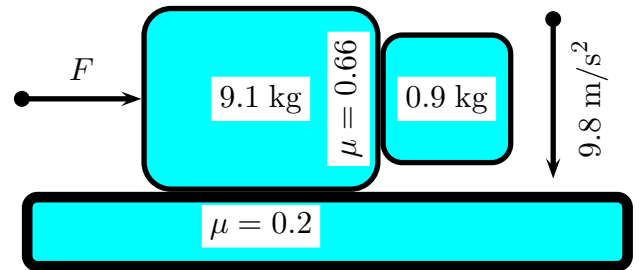
Correct answer: 0.509525.

Keeping a Block Suspended 03

004 10.0 points

The static friction between the two blocks is 0.66 and kinetic friction between the block with mass 9.1 kg and the horizontal surface is 0.2.

The acceleration of gravity is 9.8 m/s^2 .



What is the minimum force F which must be exerted on the 9.1 kg block in order that the 0.9 kg block does not fall?

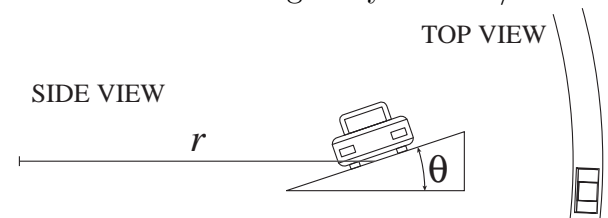
Correct answer: 168.085 N.

Inclined Curve

005 10.0 points

A high-speed test track for cars has a curved section — an arc of a circle of radius $R = 425 \text{ m}$. The curved section is banked at angle $\theta = 22^\circ$ from the horizontal to help the cars to stay in the road while moving at high speeds.

The acceleration of gravity is 9.8 m/s^2 .



One day, oil spills on the track making a few meters of the curved section frictionless. Calculate the speed v of a car which can cross the oil spill of the curve without slipping sideways.

Correct answer: 41.0216 m/s.