

Friction – Practice

1. A skater of mass 50 kg is sliding at 9.9 m/s over smooth ice.
coefficient of friction = 0.05
Calculate:
 - (i) the frictional force opposing the motion, (24.5 N)
 - (ii) the time it will take for the speed to be reduced to 5.0 m/s. (10 s)
2. A block of mass 10 kg is at rest on a polished surface. When a horizontal force of 19.8N is applied, the block accelerates at 1.0 m/s².
Calculate the coefficient of friction between the block and the surface. (0.1)
3. A box rests on rough ground.
The coefficient of friction between the box and the ground is 0.8.
A horizontal force of 20 N applied to the box gives an acceleration of 2.16m/s².
Calculate the mass of the box. (2.0 kg)
4. An object of mass m rests on rough horizontal ground with coefficient of friction μ .
A force of 4.9 N is just enough to start the object moving.
A force of 6.9 N gives it an acceleration of 2.0 m/s².
Calculate m and μ . (1.0 kg, 0.5)
5. A car of mass 1000 kg, travelling at 100 km/hr travels 60 m coming to a halt in an emergency stop once the brakes are applied.
The car decelerates at a constant rate because of the friction of its tyres on the road.
Calculate the coefficient of friction. (0.66)