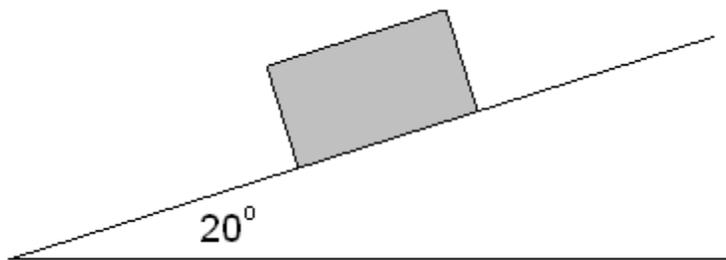


Gravity and Friction Review

1. An object has a mass of 100 kg.
 - a. What is its weight on Earth?
 - b. What is its weight on the moon? ($g_{\text{moon}} = 1.63 \text{ N/kg}$)
2. A 70 kg person is standing on a scale in an elevator. Suddenly, the cable breaks and the elevator accelerates downwards at a rate of 5 m/s^2 . What is the reading on the scale?
3. A ball is dropped from the top of a 100 m high building. Ignoring air resistance find the velocity of the ball just before it hits the ground and the time the ball took to drop.
4. A baseball is thrown straight up into the air with a velocity of 5 m/s. What is the maximum height of the baseball?
5. A 1200 kg car traveling at 20 m/s slams on its brakes and skids to a stop. If the coefficient of kinetic friction between the tires and the road is 0.6 find
 - a. The time it takes the car to stop.
 - b. The distance the car skids.
6. A 200 g box is slid across a table with an initial velocity of 2 m/s. It slides 1.5 m before stopping. What is the coefficient of friction between the car and the table?
7. A 3 kg box is sitting on an inclined plane as shown.



What is the coefficient of friction between the box and the inclined plane?

8. A block of mass 2.0 kg is placed on a frictionless plane, inclined to the horizontal at an angle of 15° .
 - a. What is the acceleration of the block as it descends the plane?
 - b. What frictional force would be required to make the block slide down the plane at a constant speed?

Answers:

- | | |
|-------------------------|--|
| 1. (a) 980 N, (b) 163 N | 5. (a) 3.4 s, (b) 34 m |
| 2. 336 N | 6. 0.14 |
| 3. 44.1 m/s down, 4.5s | 7. 0.36 |
| 4. 1.3 m | 8. (a) 2.54 m/s^2 down the plane, (b) 5.08 N |