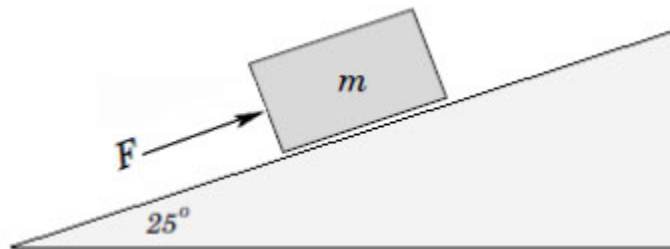


More Free Fall and Newton's Second Law Practice Problems

1. A penny dropped into a wishing well reaches the bottom in 1.50 seconds. What was the velocity at impact?
2. A boy threw a small bundle toward his girlfriend on a balcony 10.0 meters above him. The bundle stopped rising in 1.5 seconds. Was the bundle thrown high enough for her to catch it?
3. What is the force on a 1,000 kilogram-elevator that is falling freely under the acceleration of gravity only?
4. A 100 kg mass starts from rest and is accelerated by a 200 N force. What is the acceleration of the mass?
5. An object has a mass of 60 kg. What is the weight of the object on Earth?
6. What is the gravitational acceleration on a planet where a 20 kg mass has a weight of 16 N on the planet's surface?
7. A rocket has a mass of 100 kg and its engine can produce a thrust (force) of 2000 N. What is the acceleration of the rocket when fired vertically upwards?
8. A certain gun has a barrel length of 0.45 m. A bullet fired from the gun will have a muzzle velocity (velocity at the end of the barrel) of 300 m/s. The mass of the bullet is 0.017 kg and the mass of the gun is 2.8 kg. What is the acceleration of the recoil of the gun?
9. A block is pushed up a frictionless ramp as shown.



The block has a mass of 5 kg and is pushed by a force of 27 N. Calculate the acceleration of the block up the slope?

Numerical Answer:

- | | |
|----------------------|---------------------------------|
| 1. 14.7 m/s | 6. 0.8 N/kg |
| 2. yes | 7. 10.2 m/s^2 upwards |
| 3. -9800 N | 8. 607 m/s^2 |
| 4. 2 m/s^2 | 9. 1.3 m/s^2 |
| 5. 588 N | |