

Note: There will be 25 questions: 20 multiple choice questions ($20 \times 3 = 60$) and 5 Constructed response question ($5 \times 8 = 40$). There will be one extra credit question ($10 \times 1 = 10$ points). For more information about the exam and extra credit problem, Visit "www.bari-science-lab.com" and click on **Brooklyn Tech**.

1. A basketball player jumped straight up to grab a rebound. If she was in the air for 0.80 second, how high did she jump?
2. A ball dropped from rest falls freely until it hits the ground with a speed of 20 meters per second. The time during which the ball is in free fall is approximately
3. In a 4.0-kilometer race, a runner completes the first kilometer in 5.9 minutes, the second kilometer in 6.2 minutes, the third kilometer in 6.3 minutes, and the final kilometer in 6.0 minutes. The average speed of the runner for the race is approximately
4. A ball is thrown horizontally at a speed of 24 meters per second from the top of a cliff. If the ball hits the ground 4.0 seconds later, approximately how high is the cliff?
5. An astronaut drops a hammer from 2.0 meters above the surface of the Moon. If the acceleration due to gravity on the Moon is 1.62 meters per second², how long will it take for the hammer to fall to the Moon's surface?
6. The speed of a wagon increases from 2.5 meters per second to 9.0 meters per second in 3.0 seconds as it accelerates uniformly down a hill. What is the magnitude of the acceleration of the wagon during this 3.0-second interval?
7. A 1.0-kilogram ball is dropped from the roof of a building 40. meters tall. What is the approximate time of fall? [Neglect air resistance.]
8. A projectile is fired with an initial velocity of 120. meters per second at an angle, θ , above the horizontal. If the projectile's initial horizontal speed is 55 meters per second, then angle θ measures approximately
9. A 65.0-kilogram astronaut weighs 638 newtons at the surface of Earth. What is the mass of the astronaut at the surface of the Moon, where the acceleration due to gravity is 1.62 meters per second squared?

10. A 3.00-kilogram mass is thrown vertically upward with an initial speed of 9.80 meters per second. What is the maximum height this object will reach? [Neglect friction.]
11. A 160.-kilogram space vehicle is traveling along a straight line at a constant speed of 800. meters per second. The magnitude of the net force on the space vehicle is
12. An airplane traveling north at 220. meters per second encounters a 50.0-meters-per-second crosswind from west to east, as represented in the diagram below.
13. What is the final speed of an object that starts from rest and accelerates uniformly at 4.0 meters per second² over a distance of 8.0 meters?

HW: Write a paragraph on the topic below:

“Heavy objects falls faster than the light objects” --Aristotle

Be sure to watch “Brian Cox” Video to provide evidence why you disagree with Aristotle hypothesis

Due : Monday (Oct 14)