

Semester 1 Honors Physics Exam Review

Vocabulary

Accuracy vs. Precision

Units of measure: English/Metric /mks/cgs

Trigonometry/Pythagorean theorem

Mechanics

Kinematics

Dynamics

Distance/Displacement

Velocity/Speed

Acceleration

Force

Vector/Scalar

Magnitude -Angle vs. Component form

Average vs. Instantaneous

Graphical Relationships/Slope

Terminal Velocity/Air resistance

Free Fall

Gravity

Acceleration due to gravity

Projectile motion

Range

Vector components

Vector addition

Kinetic and Potential Energy

Conservation of Energy

Problems. Show ALL Work.

1. Convert 12.0 MPH to ft/s
2. What is the average velocity of an airplane that travels 3420 Km north in 11.3 hours?
3. A train has an average speed of 45.0 MPH. How far will it travel in 18.0 hours?
4. A race car completes one full lap around a 2.46 mile circular track in 1.64 minutes, What is the average speed in m/s for the lap? What is the average velocity?
5. A person makes a car trip between two cities. A record of the trip follows: 30.0 min at 40.0 Km/hr, 12 min at 111 Km/hr. and 45.0 min at 80.0 Km/hr. What is the distance between the two cities?
6. Determine the acceleration of a car who's velocity changes from 32 m/s to 96 m/s in 8.0 sec.
7. What is the minimum runway length required for an airplane who's take off velocity is 60.0 m/s if it can accelerate at a rate of 3.5 m/s^2 .
8. Excluding air resistance, how long will it take an object to fall 13.2 m?
9. Determine the final velocity of a jet aircraft accelerating at 23.1 m/s^2 for 15 sec if it is traveling at 145 m/s when it begins to accelerate.
10. If Groh is traveling at a constant speed of 70.0 miles per hour on the highway but is traveling around a curve, is he accelerating? Explain.
11. A bug is walking across a table. It moves 0.312 m @ 15.1° East of south, then travels 1.59 m @ 43.8° South of West and finally travels 0.418 m @ 3.1° East of North. What is the final displacement?
12. If the bug in Problem takes 21.2 min to do this what is his speed? What is the bug's Velocity
13. A person standing on a cliff throws a stone with horizontal speed of 8.41 m/s. The stone hits the ground below 4.96 m from the base of the cliff. How high is the cliff?
14. A projectile is fired on level ground such that the vertical component of it's velocity is 12.7 m/s and the horizontal component of it's velocity is 10.2 m/s.
 - a) What is the Initial velocity and angle of the projectile?
 - b) What is the projectile's maximum height?
 - c) How long does the projectile remain in the air?
 - d) What is the range of the projectile?
15. A projectile is launched from a 32m tall cliff with an initial velocity of 34 m/s at an angle of 34° . How far from the base of the cliff does it land?