

AP Physics 1 Summer Assignment

1. What is displacement? Also, give the equation for displacement and label all the variables.
2. What is velocity? Also, give the equation for velocity and label all the variables.
3. What is acceleration? Also, give the equation for velocity and label all the variables.
4. What is a vector quantity? What is a scalar quantity? Give 2 examples of each.
5. What is the difference between distance and displacement? Velocity and speed?
6. What does the slope of a graph represent?
7. What does the slope of a position vs time graph represent? Velocity vs time?
8. Draw position vs time graph for an object that is accelerating (speeding up). Draw a velocity vs time graph for an object that is accelerating at a constant rate.
9. How can displacement be determined from a velocity vs time graph?
10. What is constantly accelerated motion? Give the 4 equations that describe constantly accelerated motion and label all the variables.
11. Draw a velocity vs time graph for an object with a constant, negative acceleration.
12. Solve the following problem: A jet airplane starts from rest and begins to accelerate down the runway at a rate of 7.8m/s^2 . How fast is the jet moving after travelling 200m down the runway? How much time does it take to go the 200m?
13. What is the law of falling bodies?
14. Why does a hammer and a feather fall at different rates under every day circumstances?
15. What is the law of odd numbers?
16. Describe the acceleration and velocity of an object dropped from rest. (ignore air resistance)
17. Under what conditions is an object considered to be in free-fall?

18. A ball is thrown straight up into the air and then caught at the point of release. Describe the velocity and acceleration of the ball: on the way up, at the apex of the flight, on the way down.
19. What is a convenient way to represent vectors?
20. Explain how a vector in 2-dimensions can be broken into x and y components.
21. How can vectors be added graphically?
22. What is a projectile?
23. Describe the vertical motion of a projectile. (reference the acceleration and velocity)
24. Describe the horizontal motion of a projectile. (reference the acceleration and velocity)
25. What is the shape of the path of a projectile?
26. Sketch the path of a projectile launched at an angle. At 2 points on the ascent, the apex, and 2 points on the descent: sketch in the x,y velocity components at the point and the total velocity at that point.
27. Why does a projectile launched horizontally and an object dropped from rest at the same time from the same height, hit the ground at the same time?