

PHYS 211: Quiz 3

May 16, 2012

Useful formula: For motion along one dimension with constant acceleration, the position at any time t is given by $x(t) = x_0 + v_0t + \frac{1}{2}at^2$ where x_0 and v_0 are the initial (i.e. at $t = 0$) position and speed, and a is the constant acceleration. Note: Please write your answers like you're explaining to a lay person. Word it concisely and logically.

1. An object moves along a smooth (frictionless) rail at constant speed of 5 cm/s. At $t = 0$ seconds, the object is at $x = 0$ cm. What can you say about the motion of this object, i.e., about the position, speed, and acceleration as functions of time?
2. The same object is now given a little propellor. At $t = 0$ s it is at $x = 0$ cm and is moving to the right with a speed of 5cm/s. At $t = 3$ s, the propellor is switched on. In the next 3s, the object covers 30cm.
 - Calculate the value of the acceleration produced by the propellor, and the object's speed at the end of the 6 seconds.
 - Draw x vs t , v vs t and a vs t plots;
 - Have you made any assumptions? Are they reasonable?

Reread your answers to see if they are convincing. If not, try to reword them, or explain what's confusing you.