

Motion Graph Quiz

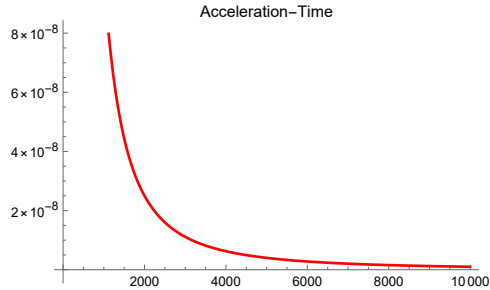
Your name-period here:

1 Dropping the Ball

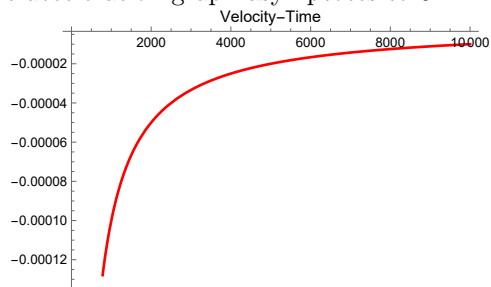
(8 pt, **All**) Draw the position, velocity, and acceleration graphs for the ball. Start all graphs immediately after the ball leaves your hand and end them once a large amount of time has passed. Include clearly labeled asymptotes when applicable.

1. **AP:** You are in a very deep pool. You have a ball that is neutrally buoyant (neither floats toward the surface, nor sinks to the bottom). You throw the ball downward with a high speed.

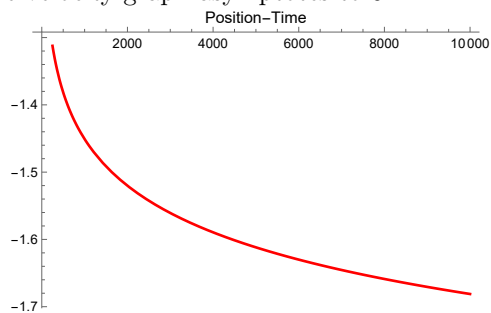
Note: the graphs are **NOT** asymptotic but not to the vertical axis at short times. While quite large, they remain always finite. Also, note that the exact numbers are arbitrary.



The acceleration graph asymptotes to 0



The velocity graph asymptotes to 0

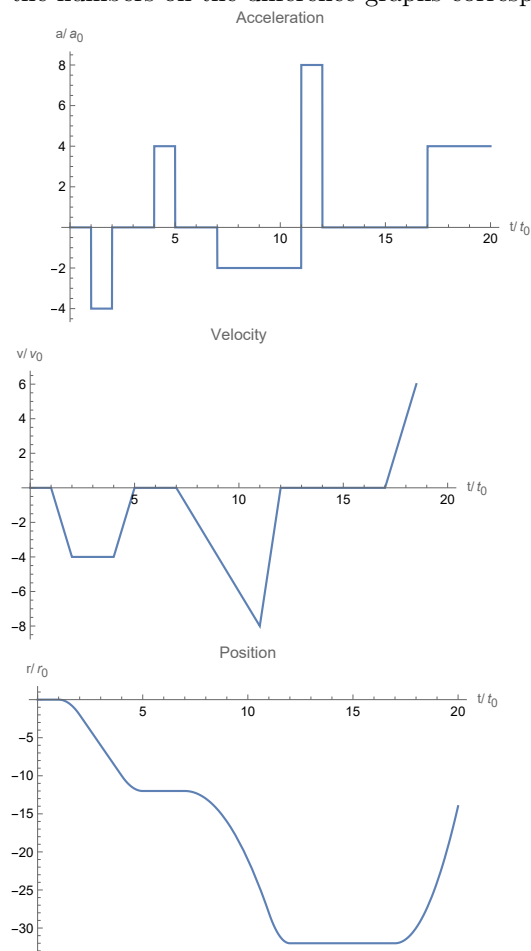


The position graph asymptotes to some value, but not 0. It does get completely flat at long enough time though because velocity asymptotes to 0.

2 Finding the graph inside yourself

(8pt) Take the direction toward the pond as positive. Create a position, velocity, and acceleration graph that match the description below. Events must happen at the same time on all graphs. You are initially at rest watching a duck. You decide to scare the duck. You quickly accelerate away from the pond, but after running for a short time, you lose sight of the duck and have to stop again. After some time, you see that the duck has gathered other ducks and formed a gang. Un-deterred, you sprint toward the duck-cabal (i.e. away from the pond). Unfortunately, just as you are about to reach your maximum sprinting speed, you realize that you probably shouldn't be doing this, so you stop. When you recover, you see that the duck mafia has regrouped ahead of you, so you sprint toward the pond.

Note: Mathematica needs numbers to generate the graphs. You don't need numbers, but do notice that the numbers on the difference graphs correspond to the same events.



3 A Purely Hypothetical Scenario

If you were going to cheat on your physics quizzes, how would you do it? Answer in the form of a poem.