Physics 102 – Spring 2014 – Recitation module 2

Why is it, do you think, that mathematical theories such as Newtonian mechanics describe our world so well?

Review Newton's three laws of motion

When a moving bus comes to a rapid stop, why is it the standing riders lurch toward the front of the bus?

When a rifle fires, it accelerates a bullet along the barrel. Why does the rifle recoil?

Since the law of inertia states that no force is needed to keep an object moving in a straight line at an unchanging speed, why is a force needed to keep a car moving?

A speeding car hits a mosquito. How does the force exerted by the car on the mosquito compare to the force exerted by the mosquito on the car?

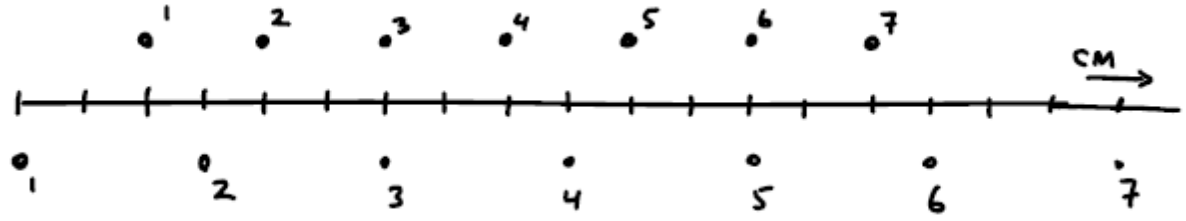
Consider two balls moving in one dimension along a ruler with marks every centimeter (cm) – not shown exactly to scale in the drawing. The position of each ball at the end of each of seven consecutive seconds is shown on the drawing below.

Are the balls accelerating?

How fast is the top ball moving?

How fast is the bottom ball moving?

At what time does the bottom ball pass the top ball?



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Are the balls accelerating?

How fast is the bottom ball moving?

Estimate the acceleration of the top ball.

What is the difference between accuracy and precision?

Try to estimate the precision with which you estimated the acceleration of the top ball. In other words, estimate the error in your estimate of the acceleration of the top ball.