

Monday Reading Assessment: Unit 1 and kinematics

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1 Chapter 3.1

1. In your own words: does a car odometer measure distance traveled or displacement? Why or why not?
2. Suppose a system has a velocity vector $\vec{v}(t) = at\hat{i} + b\hat{j}$, where t is the time. What would be the correct formula for $\vec{v}(t)$ if the system simply doubled in velocity, regardless of the time?
3. Suppose a system has a velocity vector $\vec{v}(t) = at\hat{i} + b\hat{j}$, where t is the time. What would be the correct formula for $\vec{v}(t)$ if the system reversed the direction of its velocity, regardless of the time?
4. Suppose a system has a speed $v(t) = at + b$, where t is the time. What are the units of the constant a ? If $b = 4$ m/s, and $v(4) = 8$ m/s, what is the value of a ?
5. If you go between two toll-road checkpoints and your average velocity is found to be higher than the speed limit, is it possible that your *instantaneous* speed was always below the speed limit?