

Math 151 Study Guide – Summary of Key Ideas from Day One

1) Finding average velocity is always easy: simply divide distance traveled by time passed. The only potential stumbling block is that in most cases, we will be given information about POSITION, not distance traveled. That means you'll have to find the distance traveled on your own by subtracting (position at ending time) – (position at beginning time). So if you really want to, you can think of this as a formula:

$$\text{Average speed} = \frac{\text{Ending position} - \text{Beginning position}}{\text{Ending time} - \text{Beginning time}}$$

(Although to tell you the truth, I would much prefer you understand the idea on your own, rather than think of it as a formula to memorize.)

2) When the speed of an object doesn't change at all over some period of time, the average speed is EQUAL TO the exact speed at any given instant in that time interval. If this isn't obvious, you're not thinking of it the right way.

3) When the speed of an object doesn't change very much over some period of time, the average speed is likely to be CLOSE TO the exact speed at any given instant in that time interval. If you understand the above fact, then this one is pretty much obvious, too.

4) When a time span is large, like an hour, it's likely that the speed has changed a lot, so the average speed won't tell you anything about the exact speed at any given time.

5) But if a time span is small, like a second, it's likely that the speed doesn't change very much over that time span, so the average speed is most likely pretty close to the exact speed at the beginning of the interval.

CONCLUSION: If you want a rough approximation of exact speed at any instant of time, find the average speed over a short time span that begins at that time.