

Math 8
Fall 2019

Preliminary Homework
Assigned Monday, October 21

Note: Preliminary homework is always graded credit or no credit. **You get full credit for completing the assignment, whether or not your answers are correct.** The purpose of preliminary homework is to start you thinking about the topic of the next class.

You may use your preliminary homework in activities with your classmates. You should be sure to think about these questions so you will be prepared.

Preliminary homework is always due at the *beginning* of class.

Assignment: We saw in an earlier assignment that when an object travels with constant velocity \vec{v} , the object's displacement over a period of time of length Δt is $(\Delta t)\vec{v}$, and the distance the object travels over that period of time is the magnitude of the displacement, or

$$\text{distance} = |\vec{v}| \Delta t.$$

1. Suppose an object is traveling with variable velocity $\vec{v}(t)$ for a period of time of length Δt , and t_i is some particular time in that period. If Δt is small enough, then over that period of time

- (a) The object's displacement is approximately _____;
- (b) The distance the object travels is approximately _____.

(Your answers should involve $\vec{v}(t_i)$.)

2. If the object travels between times $t = a$ and $t = b$, we break that time period up into n -many small periods of time of length Δt , and for $i = 1, \dots, n$ we choose time t_i in the i^{th} time period, then

- (a) The distance the object travels during the i^{th} time period is approximately _____;

- (b) The total distance the object travels is approximately _____.

3. Taking a limit as $n \rightarrow \infty$, the total distance the object travels is