

Part I (due at the beginning of class Tuesday, September 15)

Consider the following questions and come prepared to discuss them in class:

1. True or False: If an object moves with the same average velocity over every time interval, then its average velocity equals its instantaneous velocity at any time. Carefully explain your answer.
2. Give an example where $\lim_{x \rightarrow 0} (f(x) + g(x))$ exists but neither $\lim_{x \rightarrow 0} f(x)$ nor $\lim_{x \rightarrow 0} g(x)$ exist.
3. Suppose $\lim_{t \rightarrow 3} (tg(t)) = 12$. What does $\lim_{t \rightarrow 3} g(t)$ equal, if it exists?

Part II: Problems (due at the beginning of class Tuesday, September 15)

1. True or false (if true, carefully explain why; if false, give an explained counterexample): we can find $\lim_{x \rightarrow c} f(x)$ by computing $f(c)$.
2. For each part, create an example of a function $f(x)$ that satisfies the description and explain why your example satisfies it, or explain why it's not possible to create such an example.
 - (a) A function f and a real number c such that $\lim_{x \rightarrow c} f(x)$ exists but the function is not defined at c .
 - (b) Two functions $f(x)$ and $g(x)$ and a real number c such that $\lim_{x \rightarrow c} (f(x) + g(x)) \neq \lim_{x \rightarrow c} f(x) + \lim_{x \rightarrow c} g(x)$.