

Math 105 Quiz 7

§4.8, 4.9, 4.5

Name:

Show all work for credit. Make sure to mention any assumptions made to use conclusions of theorems.

1. At 2:00PM a car passed the 20 mile marker on the highway. At 2:10PM the car passed the 35 mile marker on the highway. Explain how and why you know the car travelled 90 mph at some point during the trip.
2. Could the above car have been traveling 100mph during the trip?
3. Use the Intermediate Value Theorem to show that there is a root of $f(x) = \cos(x) - x$ in the interval $[0, \pi]$.
4. A right triangle has sides a and b and a hypotenuse c . The side a starts at length 5 and is increasing at a rate of 3ft per second. The side b starts at length 12ft and is decreasing at a rate of 2 ft per second. After 3 seconds, at what rate is the hypotenuse changing?