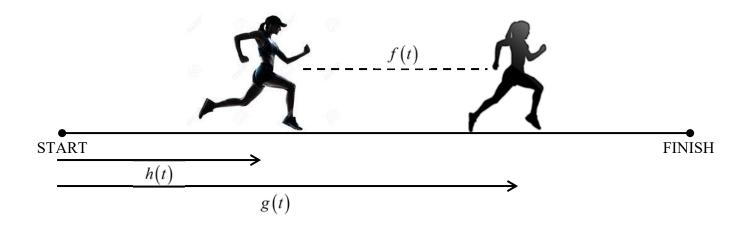Mile marker 50

Mile marker 65

10 minutes

Mr. Rainaldi is driving down the freeway. At mile marker 50, he passes a California Highway Patrol car. The officer radios ahead to keep an eye out for this car. 10 minutes later, Mr. Rainaldi passes another California Highway Patrol car at mile 65. The second officer proceeds to pull him over for speeding. Mr. Rainaldi claims he wasn't speeding. However, the Highway Patrol Officer can prove that Mr. Rainaldi was speeding using Mean Value Theorem. Use Mean Value Theorem to prove that Mr. Rainaldi had to have been speeding at some point during the given 10 minutes.

Two runners, Ms. Ofrecio and Ms. De Rosa start a marathon at the same time, and finish at the same time – 2 hours and 30 minutes later. Prove that at some time during the race they have the same speed. [Hint: Consider $f(t) = g(t) - h(t)$ where $g(t)$ and $h(t)$ are the position functions for Ms. Ofrecio and Ms. DeRosa respectively.]