

Reflection on the Mean Value Theorem

In today's interesting and informative calculus class we learned the Mean Value Theorem (MVT). The MVT guarantees a value "C" that exists in between an interval such as (a,b) where the slope of the tangent line is equal to the slope of the secant line: $f'(c) = (f(b) - f(a))/(b - a)$. The MVT does not explicitly say how many or where the C value(s) are, but instead, that at least one exists. This theorem is a generalization of Rolle's Theorem. Rolle's theorem states that any differentiable and continuous function with equality at the endpoints must have a point where the first derivative is zero.

In class we discussed a truck traveling between two points and proved that the truck driver was speeding. As you can see in this model, there is an average rate of change between the two points (the average rate was 75 miles/hour). At some point, the slope of the tangent line must have been the same as the average rate of change between the two points. Phrased differently, this means the truck driver was traveling at exactly 75 miles/hour at some point between the two patrol cars (conclusion: s/he was speeding).