Think about it:

You are going visit your Uncle, who is a highway patrolman, in Ashville. You call him to say you’re leaving Fuquay at noon and arrive in Ashville, 224 miles away, at 3 pm. Before he even says hello, he hands you a ticket for speeding. How did he know?

Given the function $y=x^{2} ,$ where on the interval [-1,4] does the IROC equal the AROC?

Mean Value Theorem

You try:

1. Find the value of c on the interval [-1, 2] for the equation $y=x^{3}-1$, such that the IROC is equal to the AROC.
2. 

Review:

Intermediate Value Theorem: If a function is continuous on [a,b], then the function takes on all y-values between f(a) and f(b).





Example:

Example:

Rolle’s Theorem: Let f be continuous on [a,b] and differentiable on (a,b). If f(a) = f(b), then there is at least one value c in (a,b) such that f’(c) = 0.

This is a special instance of the Mean Value Theorem.

Examples:

1. Explain why the conclusion to Rolle’s Theorem is not guaranteed for the function

 $ f \left(x\right)= \frac{x}{x-3}$ on the interval [1, 6].

1. Verify that the function satisfies the three hypotheses of Rolle’s Theorem on the given interval. Then find all numbers *c* that satisfy the conclusion of Rolle’s Theorem.

