

I've got all my life to live, I've got all my love to give, I will derive! _____

Period _____

Analysis Calculus Quiz 18/19 – **No Calculators!**

1. Iron Hans decided to keep track of his velocity as he biked the second leg of his triathlon. He later realized it could be modeled by the function $f(x) = \frac{-2^x}{3} + 18$ where $f(x)$ is measured in miles per hour and x is measured in hours.

a) What was the average rate of change of his velocity over the time interval $x: [0, 4]$? Include units

b) Hans used his calculator to approximate $f'(2) = -0.924$. Use words to explain what this number means in the context of the problem. Include units in your explanation.

c) Why can we be sure that the Intermediate value theorem applies to $f(x)$ over $x: [0, 4]$?

d) State one thing that the Intermediate Value Theorem would guarantee for this situation.

2. In the space on the right, sketch a graph of a function with x values A, B, C, and D (in that order) that satisfies the following conditions. Label the points of course!!

i) The derivative at $x=A$ is zero.

ii) The derivative at $x=B$ is a very large and positive number.

iii) The function has a limit at $x=C$ but no output.

iv) The function has an output but no limit at $x=D$.