

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 $x=D$.