WRITE CLEARLY AND SHOW ALL YOUR WORK. YOU MAY USE A CALCULATOR.

1. Say you walk at 3 miles per hour for 20 minutes and then run at 10 miles an hour for 8 minutes. At what constant speed would a person have to walk/run in order to travel the same distance in the same time?

2. True or False:

    (a) _____ If f is continuous at $x = c$, then f is differentiable at $x = c$.

    (b) _____ If f is not continuous at $x = c$, then f is not differentiable at $x = c$.

    (c) _____ If f is not differentiable at $x = c$, then f is not continuous at $x = c$.

    (d) _____ If f is differentiable at $x = c$, then f is continuous at $x = c$.

3. Explain what the height of the graph of $y = f'(x)$ at the point where $x = c$ tells you about the graph of $f(x)$ at the point where $x = c$. Write your answer as a complete English sentence.

4. Using the *definition* of the derivative, show that if $f(x) = mx + b$ is any linear function, then $f'(x) = m$.