Quiz 3 Calc 1 Due 9/15/2021

Each lettered part is worth 1 point. Don't panic.

1. Let $r(t) = -16t^2 + 128t$ represent the height of a rocket shot upwards by a Calc 1 student to celebrate surviving the first exam.

   a) Evaluate the average velocity of the rocket over the interval [3, 4].

   b) Evaluate the average velocity of the rocket over the interval [3.5, 4].

   c) Evaluate the average velocity of the rocket over the interval [3.9, 4].

   d) Evaluate the average velocity of the rocket over the interval [3.99, 4].

   e) Evaluate the average velocity of the rocket over the interval [4, 5].

   f) Evaluate the average velocity of the rocket over the interval [4, 4.5].

   g) Evaluate the average velocity of the rocket over the interval [4, 4.1].

   h) Evaluate the average velocity of the rocket over the interval [4, 4.01].

   i) Evaluate $\lim_{h \to 0} \frac{r(4+h) - r(4)}{h}$.

   j) What is the rocket's instantaneous velocity at $t = 4$?

2. Consider the function $f(x) = 1/x$.

   a) Find the slope of the secant line crossing the graph of f where $x = 3$ and $x = 4$.

   b) Find the slope of the secant line crossing the graph of f where $x = 3.5$ and $x = 4$.

   c) Find the slope of the secant line crossing the graph of f where $x = 3.9$ and $x = 4$.

   d) Find the slope of the secant line crossing the graph of f where $x = 3.99$ and $x = 4$.

   e) Find the slope of the secant line crossing the graph of f where $x = 4$ and $x = 5$.

   f) Find the slope of the secant line crossing the graph of f where $x = 4$ and $x = 4.5$.

   g) Find the slope of the secant line crossing the graph of f where $x = 4$ and $x = 4.1$.

   h) Find the slope of the secant line crossing the graph of f where $x = 4$ and $x = 4.01$.

   i) Evaluate $\lim_{h \to 0} \dfrac{f(4+h) - f(4)}{h}$.

   j) Find the slope of the tangent line to the graph of f at the point where $x = 4$.