Problem Set 3

NAME

DATE

Due on Friday!

1. Summation
   (a) $\sum_{n=1}^{7} 3$
   (b) $\sum_{n=0}^{4} 2n + 8$
2. Limits and Continuity
   (a) What is a limit?
   (b) Why do we care about limits and tangents?
   (c) What is a continuous function?
3. Derivative Foundations
   (a) What is a derivative? Why might we find it useful?
   (b) Find an example on the internet of a derivative used to solve a problem in real life.
4. Derivatives by hand : Compute manually, using the formula for a derivative (i.e. $lim_{h \to 0} \frac{f(x+h)-f(x)}{h}$).
   (a) $f(x) = x^3$
5. Derivatives using the formulas: Compute these using the rules from class.
   (a) $f(x) = 2x^2 + 7x + 9$
   (b) $f(x) = 3x^2$
   (c) $f(x) = x^3$
   (d) $f(x) = ln(x)$
   (e) $f(x) = e^{3x}$
   (f) $f(x) = 2e^{-2x} - x^{0.5}$

(g) $f(x) = (3x^4 - 6x + 2)(x^2 - 4)$

(h) $f(x) = ln(e^x)$

6. Check out this resource on critical points: https://www.cuemath.com/calculus/critical-point/. Based on this, what are critical points and how do derivatives help us find them? Why might this be important (can provide an example from another website)?

7. Topics and Questions

   (a) List three things you struggled with on today's assignment.

   (b) What is your plan for improving the items listed above?

   (c) What percent of the material was new to you today?

   (d) What is one new concept you learned today?

   (e) What question do you still have about the material?