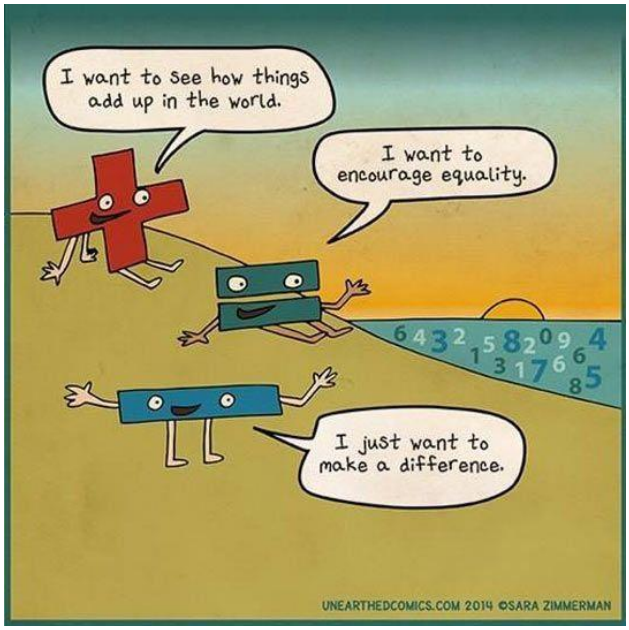
Name: _____

Calculus

(1/22-2/15)



"Arithmetic! Algebra! Geometry! Grandiose trinity! Luminous triangle! Whoever has not known you is without sense!"

-- Comte de Lautreamont

Overview:

Welcome to Quarter Three! For the next month, we will be using our technical know-how of derivatives to approach optimization problems: when is it most cost effective to approach certain projects? How do we rearrange materials to optimize the space it takes up? Before we ask these questions, we must first mathematically define how a function behaves. By the end of this unit, we will have an understanding of how extrema can be found and will have more practice in taking derivatives.

Reminders:

- **No late work will be accepted from this point forward.**
- **Individual Work: Show all your steps on how you get to your answer! I will take points off for no work.**
- **IXL: If you choose to achieve proficiency on 3 skills, you must work on your skills for at least 30min.**

Lessons:

Content Lesson Themes

___ 5.1: Functions: Increase, Decrease, Concavity

___ 5.2: Functions: Relative Extrema, Graphing Polynomials

____ 5.4: Absolute Maxima and Minima

____ 5.5: Applied Maximum and Minimum Problems

____ 5.6: Rolle's Thm; Mean-Value Thm

Assignments	Due Date (BoC)
1/22-1/25: **Guiding Question: How can we mathematically describe the visual aspects of a graphed function?** **____ 1)** Definitions/Theorems (do one of the below). See classroom for list and graphic organizer. a. Graphic Organizer b. Mind Map c. Diagram (include all terms on a rough sketch of a function) **____ Lesson:** 5.1: Functions: Increase, Decrease, Concavity **____*2) Problem Set:*** 5.1: p.276 #'s 9, 11, 13, 15, 19, 26, 29A **____ *3) IXL:*** Achieve proficiency in 3 skills (smart-score of 80) **OR** spend 1-hour total for the week. You may work either in: a. Recommended Tab (AT LEAST 9th grade level!) b. Calculus: L.9, L.11, L.13, L.14 (Product, Quotient, Chain Rule)	**Thurs, 1/24** **Mon, 1/29** **Mon, 1/29**
1/28-1/31: This is an early dismissal week. Classes will be held for 1 hour on Tues/Thurs. **Guiding Question: Where can we apply derivatives to find the "extreme values" or the turning points of functions?** **____ Lesson:** 5.2: Relative Extrema **____ *4)* Problem Set** –5.2: p.295 #'s 1, 7, 9, 13, 15, 17, 19, 27, 45 (use desmos!) **____ Khan Academy Lesson:** These videos will cover concepts from 5.4, including how to find the absolute extrema of a function. Take notes on both! See classroom for links. a. Finding Relative Extrema (Review) b. Finding Absolute Extrema **____ *5)* Problem Set –** 5.4: p.7, 9, 13, 17, 19, 21, 45	**Wed, 1/30** **Mon, 2/4**

____ ***6) IXL:*** Achieve proficiency in 3 skills (smart-score of 80) **OR** spend 1-hour total for the week. You may work either in: a. Recommended Tab (AT LEAST 9th grade level!) b. Calculus: L.3-L.6 (Derivatives of trig/expononial/logarithmic functions)	**Mon, 2/4**
2/4-2/8: **Guiding Question: How can we interpret extreme values as optimization or as being related to average values?** ____ **Lesson:** Optimization Problems ____ **7) *Group Activity*- Maximizing Box Space:** Follow the instructions on Google Classroom to create an optimized box given some dimensions. Mini-project should include derivation of the volume. ____ **8) QUIZ:** 5.1/5.2/5.4: Function Analysis ____ **Lesson:** 5.7: Rolle's Theorem; Mean Value Theorem ____ **9) Problem Set-** 5.7: p.335 #'s 1, 3, 7, 8, 9, 19, 21	**Thurs, 2/7** **Thursday (Beginning of Class)** **Mon, 2/12**
2/11-2/15: **Guiding Question: How can you fully describe a function in terms of average rate of change and instantaneous rate of change?** ____ **10) Group Activity:** With a partner, you will have a choice of a function which you will describe through the vocabulary reviewed in assignment #1. In addition, you will prove Rolle's Theorem as well as the Mean Value Theorem. See classroom for more details.	**Thurs, 2/15**