Math 1211 Discussion Assignment

Reading Assignment

Herman, E. & Strang, G. (2020). Calculus volume 1. OpenStacks. Rice University.

* Read Chapter 4, sections 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, pages 511-527, 533-547, 553-563, 570-578, 588-595 and pages 599-608.
  + Sections 4.8 through 4.10
* Review the completed examples to understand the concepts and then complete some problems on your own. Review and practice will contribute to your success in this course.
* Chapter 5: 5.1, 5.2, 5.3, 5.4, 5.5, 5.6
* You should attempt the problems in the book as indicated, and you are allowed to use the book and other resources to understand how to answer the problems You are welcome to ask about these in the discussion forum.
  + 5.1  14,15, 25, 39, 43
  + 5.2   61,77, 81, 93, 99, 111, 115
  + 5.3  149, 155, 171, 177, 185, 199
  + 5.4  207, 211, 234, 247
  + 5.5  257, 261, 265, 269, 273, 279, 293, 301
  + 5.6 321, 322, 324, 325, 330, 334, 335, 337, 355

**Discussion prompt:** For the discussion item this week, explain in your own words how the definite integral can be used to determine at least 2 different things? For example, it could be used to determine profit over a given period or to calculate total distance traveled over a certain time, or it could be any other topic of your choice. Take a moment and review problems 214-253 in section 5.4 if you need ideas.

According to (*5.2 The Definite Integral - Calculus Volume 1 | OpenStax*, n.d.), by the definition, the definite integral can obtain the area under a curve of a function. For the function which continues over the boundary, we can calculate the definite integrals.

We can adapt the integral formula to any function whose anti-derivative is physical or economically meaningful. The first usage is things that involve the function of change of rate like speed, increase rate, and so on. It is more useful for calculation we can measure the speed easily.

Example 1, Space X is launching a rocket into space. We only know the engine is capable to provides an acceleration of X meter/sec. The integral process can obtain the speed of a rocket by the time and acceleration and the distance it needs to travel. And by any time, the acceleration should not break any parts of the rocket.

Example 2, Jon is working on his push-ups. He can do 0 push-ups now, but after completing a training cycle of 1 week, he will be able to f(x)=2lnx more push-ups for each extra week’s training. And we want to know how long he will need to continue to train until he can pass the exam which needs 10 push-ups.

Reference

*5.2 The Definite Integral - Calculus Volume 1 | OpenStax*. (n.d.). Retrieved October 23, 2022, from https://openstax.org/books/calculus-volume-1/pages/5-2-the-definite-integral