

Unit 6 - Area, Volume, L'Hopital's Rule, Slope Fields, Linear Motion, Applications of Definite Integrals: Study Guide

Unit 1 - Limits: 1-2 through 1-5, and 3-5

Unit 2 - Differentiation: 2-1 through 2-6

Unit 3 - Applications of Differentiation: 3-1 through 3-4, 3-6, 3-7

Unit 4 - Integration: 4-1 through 4-6

Unit 5 - Logarithmic, Exponential, and other Transcendental Functions 5-1 through 5-7

6-2

- ☐ I know what a differential equation is.
- ☐ I know how to solve a differential equation using the method of "separation of variables."
- ☐ I know how to solve problems involving the equation $\frac{dy}{dt} = ky$ And Newton's Law of Cooling $\frac{dy}{dt} = k(y - T)$

7-1

- ☐ I know how to find the area of a region between two curves using a:
 - dx-type
 - dy-type
 - type where there is more than two intersections.

7-2

- ☐ I know and know how to find the volume of regions using:
 - dx-type
 - dy-type
 - type where there is more than two intersections
 - Disc type
 - Washer type
 - Rotate around axes, or other horizontal or vertical line
 - Known cross-sections including squares, rectangles, triangles, and semicircles

Slope Fields

- ☐ I can draw a slope field given a function of differential equation.
- ☐ I can match up a slope field with a differential equation and vise versa.
- ☐ I can draw a particular solution to a differential equation given a point.
- ☐ I can find the particular solution to a differential equation given a point.

Applications of Definite Integrals

- ☐ I can solve application problems that involve definite integrals

Linear Motion

- ☐ I can solve linear motion problems involving a particle moving along the x-axis including:
 - displacement vs. distance traveled
 - velocity vs. speed
 - speeding up vs. slowing down
 - moving left vs. moving right vs. not moving
 - moving toward the origin vs. moving away from the origin
 - position vs. velocity vs. acceleration

Unit 6+ Homework Assignments

6-2: 1-19 (odd), skip #13, Differential Equations Practice Worksheet

7-1: 1-7 (odd), 13-27 (odd), 37-47 (odd), 79

7-2: 1, 5, 7, 17, 21, 27, 31, 33, 34, 41, 43, 63

AP Free Response (Area/Volume): [2002B #1](#), [2005B #1](#), [2010 #4](#)

[Slope Field Worksheet](#)

[Applications of Definite Integrals Worksheet](#) and [Amusement Park Problem](#)

[Particle moving along the x-axis Problem Packet](#)

Review: Pg. 431/ 15-21 (odd)

Pg. 503/ 3-13 (odd), 18

Pg. 579/ 73-79 (odd)

[2007 #1](#) (Area/Volume w/ calculator), [2009 #4](#) (Area/Volume w/o calculator),

[2006 #5](#) (Slope Field), [2003 #2](#) (Particle)