Calculus BC Schedule--Chapter 5 The Definite Integral

Date	Lesson	HW Assignment
6-Nov	5.1 Estimating with Finite Sums	**HW2**--p.270 #5, 17, 19a, 23
9-Nov	5.1 Estimating with Finite Sums	**HW3**--p.270 #35,36, Video on Definite Integrals, p.282 #7,11,13
10-Nov	5.2 Definite Integrals	**HW4**--p.282 #19,20,29,43,44
11-Nov	*Check & Connect Day* AP Activity is due tomorrow	**NO Additional Homework**
12-Nov	5.2 Definite Integrals	**HW5**--AP Classroom Definite Integrals HW (skip #1 part d), Video on Rules for Definite Integrals
13-Nov	5.3 Definite Integrals & Antiderivatives	**HW6**--p.290 #1,47, Video on Antidifferentiation, p.337 #1-6all
16-Nov	6.2 Antidifferentiation	**HW7**--Video on Definite Integrals, p.303 #27,29,34,35
17-Nov	***1/2 Day Schedule*** *Asynchronous Learning Day*	**NO Additional Homework**
18-Nov	6.2 Antidifferentiation	**HW8**--p.316 #19,22,24,27, Video on U-Substitution, p.338 #17-20
19-Nov	6.2 Antidifferentiation	**HW9**--p.338 #23,27,32,33, Video on Definite Integrals w/U-Sub, p.338 #53,61
20-Nov	6.2 Antidifferentiation	**HW10**--p.338 #55,58,60,65,66,74,75
23-Nov	6.2 Antidifferentiation	**HW11**--Video on Integration by Parts, p.346 #1,5,7
24-Nov	6.3 Antidifferentiation by Parts	**HW12**--p.346 #11,13,25,30,38,39
25-Nov	**NO SCHOOL - Day Before Turkey Day**	**NO Additional Homework**
26-Nov	**NO SCHOOL - Turkey Day**	**NO Additional Homework**
27-Nov	**NO SCHOOL - Day After Turkey Day**	**NO Additional Homework**
30-Nov	6.3 Antidifferentiation by Parts	**HW13**--p.346 #19,23, Video on Logistic Growth, p.369 #5,7
1-Dec	6.5 Logistic Growth (Partial Fractions)	**HW14**--p.369 #11,13,19, Video on MVT for Integrals & Average Value, p.291 #31,35
2-Dec	*Check & Connect Day* **Quick M/C Quiz for Unit 4**	**NO Additional Homework**
3-Dec	5.3 Definite Integrals & Antiderivatives	**HW15**--p.291 #49,50, Video on 2nd FTC, p.303 #5,9,11
4-Dec	5.4 2nd Fundamental Theorem of Calculus	**HW16**--AP Classroom 2nd FTC HW

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Date	Lesson	HW Assignment
7-Dec	5.4 2nd Fundamental Theorem of Calculus	**HW17**--p.303 #57abc, Video on Trapezoid Rule, p.312 #1,8,35
8-Dec	***1/2 Day Schedule*** *Asynchronous Learning Day*	**NO Additional Homework**
9-Dec	5.5 Trapezoid Rule	**HW18**--p.314 #31,34,36,58a
10-Dec	5.5 Trapezoid Rule	**HW19**--Unit 6 Progress Check FRQ Part A
11-Dec	Chapter 5 Review	**HW20**--p.316 #9,18,28,33b,40,49, 54 p.373 #8,9,13,19,24
14-Dec	Chapter 5 Review	**STUDY for Test**
15-Dec	**Chapter 5 Test**	**NO Additional Homework**
16-Dec	**Check & Connect Day** *(1st & 3rd hours)*	**NO Additional Homework**
17-Dec	**Check & Connect Day** *(2nd & 4th hours)*	**NO Additional Homework**
18-Dec	**Check & Connect Day** *(6th & 5th hours)*	**NO Additional Homework**
12/19-1/3	**WINTER BREAK**	**NO Additional Homework**

UNIT 5: Definite Integrals

CHA-4

Definite integrals allow us to solve problems involving the accumulation of change over an interval.

LEARNING OBJECTIVE	ESSENTIAL KNOWLEDGE
CHA-4.A Interpret the meaning of areas associated with the graph of a rate of change in context.	**CHA-4.A.1** The area of the region between the graph of a rate of change function and the x axis gives the accumulation of change. **CHA-4.A.2** In some cases, accumulation of change can be evaluated by using geometry. **CHA-4.A.3** If a rate of change is positive (negative) over an interval, then the accumulated change is positive (negative). **CHA-4.A.4** The unit for the area of a region defined by rate of change is the unit for the rate of change multiplied by the unit for the independent variable.

FUN-5

The Fundamental Theorem of Calculus connects differentiation and integration.

LEARNING OBJECTIVE	ESSENTIAL KNOWLEDGE
FUN-5.A Represent accumulation functions using definite integrals.	**FUN-5.A.1** The definite integral can be used to define new functions. **FUN-5.A.2** If f is a continuous function on an interval containing a, then $\frac{d}{dx}\left(\int_a^x f(t)dt\right) = f(x)$, where x is in the interval.
FUN-5.A Represent accumulation functions using definite integrals.	**FUN-5.A.3** Graphical, numerical, analytical, and verbal representations of a function f provide information about the function g defined as $g(x) = \int_a^x f(t)dt$.

Calculus BC Schedule--Chapter 5 The Definite Integral

Date **Lesson** **HW Assignment**

LIM-5

Definite integrals can be approximated using geometric and numerical methods.

LEARNING OBJECTIVE	ESSENTIAL KNOWLEDGE
LIM-5.A Approximate a definite integral using geometric and numerical methods.	**LIM-5.A.1** Definite integrals can be approximated for functions that are represented graphically, numerically, analytically, and verbally. **LIM-5.A.2** Definite integrals can be approximated using a left Riemann sum, a right Riemann sum, a midpoint Riemann sum, or a trapezoidal sum; approximations can be computed using either uniform or nonuniform partitions. **LIM-5.A.3** Definite integrals can be approximated using numerical methods, with or without technology. **LIM-5.A.4** Depending on the behavior of a function, it may be possible to determine whether an approximation for a definite integral is an underestimate or overestimate for the value of the definite integral.
LIM-5.B Interpret the limiting case of the Riemann sum as a definite integral.	**LIM-5.B.1** The limit of an approximating Riemann sum can be interpreted as a definite integral. **LIM-5.B.2** A Riemann sum, which requires a partition of an interval I, is the sum of products, each of which is the value of the function at a point in a subinterval multiplied by the length of that subinterval of the partition.
LIM-5.C Represent the limiting case of the Riemann sum as a definite integral.	**LIM-5.C.1** The definite integral of a continuous function f over the interval $[a, b]$, denoted by $\int_a^b f(x)dx$, is the limit of Riemann sums as the widths of the subintervals approach 0. That is, $\int_a^b f(x)dx = \lim_{\max \Delta x_i \to 0} \sum_{i=1}^{n} f(x_i^*)\Delta x_i$, where n is the number of subintervals, Δx_i is the width of the ith subinterval, and x_i^* is a value in the ith subinterval. **LIM-5.C.2** A definite integral can be translated into the limit of a related Riemann sum, and the limit of a Riemann sum can be written as a definite integral.

FUN-6

Recognizing opportunities to apply knowledge of geometry and mathematical rules can simplify integration.

LEARNING OBJECTIVE	ESSENTIAL KNOWLEDGE
FUN-6.A Calculate a definite integral using areas and properties of definite integrals.	**FUN-6.A.1** In some cases, a definite integral can be evaluated by using geometry and the connection between the definite integral and area. **FUN-6.A.2** Properties of definite integrals include the integral of a constant times a function, the integral of the sum of two functions, reversal of limits of integration, and the integral of a function over adjacent intervals. **FUN-6.A.3** The definition of the definite integral may be extended to functions with removable or jump discontinuities.
FUN-6.B Evaluate definite integrals analytically using the Fundamental Theorem of Calculus.	**FUN-6.B.1** An antiderivative of a function f is a function g whose derivative is f. **FUN-6.B.2** If a function f is continuous on an interval containing a, the function defined by $F(x) = \int_a^x f(t)dt$ is an antiderivative of f for x in the interval. **FUN-6.B.3** If f is continuous on the interval $[a, b]$ and F is an antiderivative of f, then $\int_a^b f(x)dx = F(b) - F(a)$.
FUN-6.C Determine antiderivatives of functions and indefinite integrals, using knowledge of derivatives.	**FUN-6.C.1** $\int f(x)dx$ is an indefinite integral of the function f and can be expressed as $\int f(x)dx = F(x) + C$, where $F'(x) = f(x)$ and C is any constant. **FUN-6.C.2** Differentiation rules provide the foundation for finding antiderivatives. **FUN-6.C.3** Many functions do not have closed-form antiderivatives.
FUN-6.D For integrands requiring substitution or rearrangements into equivalent forms: (a) Determine indefinite integrals. (b) Evaluate definite integrals.	**FUN-6.D.1** Substitution of variables is a technique for finding antiderivatives. **FUN-6.D.2** For a definite integral, substitution of variables requires corresponding changes to the limits of integration.
FUN-6.D For integrands requiring substitution or rearrangements into equivalent forms: (a) Determine indefinite integrals. (b) Evaluate definite integrals.	**FUN-6.D.3** Techniques for finding antiderivatives include rearrangements into equivalent forms, such as long division and completing the square.
FUN-6.E For integrands requiring integration by parts: (a) Determine indefinite integrals. BC ONLY (b) Evaluate definite integrals. BC ONLY	**FUN-6.E.1** Integration by parts is a technique for finding antiderivatives. BC ONLY
FUN-6.F For integrands requiring integration by linear partial fractions: (a) Determine indefinite integrals. BC ONLY (b) Evaluate definite integrals. BC ONLY	**FUN-6.F.1** Some rational functions can be decomposed into sums of ratios of linear, nonrepeating factors to which basic integration techniques can be applied. BC ONLY