Calculus AB Schedule--Chapter 5 The Definite Integral

Date	Lesson	HW Assignment
4-Jan	**NO SCHOOL**--*Teacher Institute Day*	**NO Additional Homework**
5-Jan	**NO SCHOOL**--*Remote Learning Planning*	**NO Additional Homework**
6-Jan	5.1 Estimating with Finite Sums	**HW1**--p.270 #5, 17, 19a, 23, Video on Over/Underestimates
7-Jan	5.1 Estimating with Finite Sums	**HW2**--p.270 #35,36, Video on Definite Integrals, p.282 #7,11,13
8-Jan	5.2 Definite Integrals	**HW3**--p.282 #19,20,29,43,44
11-Jan	*PLT Planning Day*	
12-Jan	5.2 Definite Integrals	**HW4**--AP Classroom Definite Integrals HW (skip #1 part d), Video on Rules for Definite Integrals
13-Jan	5.3 Definite Integrals & Antiderivatives	**HW5**--p.290 #1,47, Video on Antidifferentiation, p.337 #1-6all
14-Jan	6.2 Antidifferentiation	**HW6**--Video on Definite Integrals, p.303 #27,29,34,35
15-Jan	6.2 Antidifferentiation	**HW7**--p.316 #18,19,22,23,24,26
18-Jan	**NO SCHOOL - M.L. King, Jr B-day**	**NO Additional Homework**
19-Jan	6.2 Antidifferentiation	**HW9**--Video on U-Substitution, p.338 #17,20
20-Jan	6.2 Antidifferentiation	**HW10**--p.338 #18,19,23,24,73
21-Jan	6.2 Antidifferentiation	**HW11**--p.338 #25,27,31,33, Video on Definite Integrals w/U-Sub
22-Jan	6.2 Antidifferentiation	**HW12**--p.338 #53,54,55,59

Calculus AB Schedule--Chapter 5 The Definite Integral

Date	Lesson	HW Assignment
25-Jan	*Check & Connect Day*	
26-Jan	6.2 Antidifferentiation	**HW13**--p.338 #63,66, Video on MVT for Integrals & Average Value
27-Jan	5.3 Definite Integrals & Antiderivatives	**HW14**--p.291 #31,35, Video on 2nd FTC, p.303 #1,3,13
28-Jan	5.4 2nd Fundamental Theorem of Calculus	**HW15**--p.303 #10,11,15,17
29-Jan	5.4 2nd Fundamental Theorem of Calculus	**HW16**--p.303 #57abc, Video on Trapezoid Rule
1-Feb	*Check & Connect Day*	
2-Feb	5.5 Trapezoid Rule	**HW17**--p.312 #8,31,36, p.315 Quick Quiz #1
3-Feb	5.5 Trapezoid Rule	**HW18**--p.316 #17,25,34b,39,40,45, p.373 #5,13
4-Feb	Chapter 5 Review	**Study for Test**
5-Feb	**Chapter 5 Test**	**NO Additional Homework**
8-Feb	**1/2 Day SCHOOL** - *PLT Planning Day*	
9-Feb	Chapter 5 AP Lab Activity	*AP Activity due 2/16*

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 AB 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.