

Calculus AB Schedule--Unit 2/Chapter 3 Derivatives

| <u>Date</u> | <u>Lesson</u> | <u>HW Assignment</u> |
|-------------|--|--|
| 17-Sep | AP Activity: Chapter 2 | HW1 --Video on Differentiability AP Activity: Chapter 2 Due 9/24 |
| 18-Sep | 3.1 Derivative of a Function | HW2 --Video on Using Graphing Calculator, p.105 #3,7,10,18 (use calculator for #18) |
| 21-Sep | 3.1 Derivative of a Function | HW3 --Video on Basic Rules of Derivatives, p.124 #5,7,29 |
| 22-Sep | 3.3 Rules for Differentiation | HW4 --p.124 #32,33,56, p.126 Quick Quiz #4 |
| 23-Sep | SAT for Some Seniors 3.3 Rules for Differentiation | HW5 --Video on Product Rule,p.124 #13,16 |
| 24-Sep | 3.3 Rules for Differentiation | HW6 --Video on Quotient Rule, p.124 #17,27 |
| 25-Sep | 3.3 Rules for Differentiation | HW7 --Video on Differentiability, p.114 #1,3 (use derivative rules, not definition of derivative) |
| 28-Sep | 3.2 Differentiability | HW8 --p.114 #32, p.126 Quick Quiz #1, p.182 #53 |
| 29-Sep | 3.2 Differentiability | HW9 --p.115 #39b,40,41, Video on Sketching Graph of f' |
| 30-Sep | 3.1 Derivative of a Function | HW10 --p.106 #14,16 (be sure to write reasons), 26, Video on Particle Motion |
| 1-Oct | 3.4 Velocity and Other Rates of Change | HW11 --Particle Motion Practice |
| 2-Oct | 3.4 Velocity and Other Rates of Change | HW12 --p.135 #19bcde, 37bcd,45 |
| 5-Oct | 3.4 Velocity and Other Rates of Change | HW13 --AP FRQ Particle Motion |
| 6-Oct | 3.4 Velocity and Other Rates of Change | HW14 --Video on Trig Derivatives |
| 7-Oct | 3.5 Derivatives of Trigonometric Functions | HW15 --p.146 #1,3,5,9,14ab,48 |
| 8-Oct | 3.5 Derivatives of Trigonometric Functions | HW16 --p.146 #21,33ab,37,46 |
| 9-Oct | <i>Chapter 3 REVIEW</i> | HW17 --p.181 #1,3,4,7,43,46,54,66ae,81abcd |
| 12-Oct | NO SCHOOL -- Columbus Day | NO Additional Homework |
| 13-Oct | <i>Chapter 3 REVIEW</i> | Study for Test |
| 14-Oct | 1/2 Day Schedule <i>SAT for some Seniors</i> | NO Additional Homework |
| 15-Oct | Chapter 3 TEST | HW1 --Video on Chain Rule, p.153 #16,19 |

Calculus AB Schedule--Unit 2/Chapter 3 Derivatives

Date

Lesson

HW Assignment

UNIT 2: Differentiation

CHA-2
Derivatives allow us to determine rates of change at an instant by applying limits to knowledge about rates of change over intervals.

LEARNING OBJECTIVE

CHA-2.A
Determine average rates of change using difference quotients.

ESSENTIAL KNOWLEDGE

CHA-2.A.1
The difference quotients $\frac{f(a+h)-f(a)}{h}$ and $\frac{f(x)-f(a)}{x-a}$ express the average rate of change of a function over an interval.

CHA-2.B
Represent the derivative of a function as the limit of a difference quotient.

ESSENTIAL KNOWLEDGE

CHA-2.B.1
The instantaneous rate of change of a function at $x = a$ can be expressed by $\lim_{h \rightarrow 0} \frac{f(a+h)-f(a)}{h}$ or $\lim_{x \rightarrow a} \frac{f(x)-f(a)}{x-a}$, provided the limit exists. These are equivalent forms of the definition of the derivative and are denoted $f'(a)$.

CHA-2.B
Represent the derivative of a function as the limit of a difference quotient.

ESSENTIAL KNOWLEDGE

CHA-2.B.2
The derivative of f is the function whose value at x is $\lim_{h \rightarrow 0} \frac{f(x+h)-f(x)}{h}$, provided this limit exists.

CHA-2.B.3
For $y = f(x)$, notations for the derivative include $\frac{dy}{dx}$, $f'(x)$, and y' .

CHA-2.B.4
The derivative can be represented graphically, numerically, analytically, and verbally.

CHA-2.C
Determine the equation of a line tangent to a curve at a given point.

ESSENTIAL KNOWLEDGE

CHA-2.C.1
The derivative of a function at a point is the slope of the line tangent to a graph of the function at that point.

CHA-2.D
Estimate derivatives.

ESSENTIAL KNOWLEDGE

CHA-2.D.1
The derivative at a point can be estimated from information given in tables or graphs.

CHA-2.D.2
Technology can be used to calculate or estimate the value of a derivative of a function at a point.

CHA-3
Derivatives allow us to solve real-world problems involving rates of change.

LEARNING OBJECTIVE

CHA-3.B
Calculate rates of change in applied contexts.

ESSENTIAL KNOWLEDGE

CHA-3.B.1
The derivative can be used to solve rectilinear motion problems involving position, speed, velocity, and acceleration.

FUN-2
Recognizing that a function's derivative may also be a function allows us to develop knowledge about the related behaviors of both.

LEARNING OBJECTIVE

FUN-2.A
Explain the relationship between differentiability and continuity.

ESSENTIAL KNOWLEDGE

FUN-2.A.1
If a function is differentiable at a point, then it is continuous at that point. In particular, if a point is not in the domain of f , then it is not in the domain of f' .

FUN-2.A.2
A continuous function may fail to be differentiable at a point in its domain.

FUN-3
Recognizing opportunities to apply derivative rules can simplify differentiation.

LEARNING OBJECTIVE

FUN-3.A
Calculate derivatives of familiar functions.

ESSENTIAL KNOWLEDGE

FUN-3.A.1
Direct application of the definition of the derivative and specific rules can be used to calculate the derivative for functions of the form $f(x) = x^n$.

FUN-3.A
Calculate derivatives of familiar functions.

ESSENTIAL KNOWLEDGE

FUN-3.A.2
Sums, differences, and constant multiples of functions can be differentiated using derivative rules.

FUN-3.A.3
The power rule combined with sum, difference, and constant multiple properties can be used to find the derivatives for polynomial functions.

FUN-3.A
Calculate derivatives of familiar functions.

ESSENTIAL KNOWLEDGE

FUN-3.A.4
Specific rules can be used to find the derivatives for sine, cosine, exponential, and logarithmic functions.

FUN-3.B
Calculate derivatives of products and quotients of differentiable functions.

ESSENTIAL KNOWLEDGE

FUN-3.B.1
Derivatives of products of differentiable functions can be found using the product rule.

FUN-3.B.2
Derivatives of quotients of differentiable functions can be found using the quotient rule.

FUN-3.B
Calculate derivatives of products and quotients of differentiable functions.

ESSENTIAL KNOWLEDGE

FUN-3.B.3
Rearranging tangent, cotangent, secant, and cosecant functions using identities allows differentiation using derivative rules.

FUN-3.F
Determine higher order derivatives of a function.

ESSENTIAL KNOWLEDGE

FUN-3.F.1
Differentiating f' produces the second derivative f'' , provided the derivative of f' exists; repeating this process produces higher-order derivatives of f .

FUN-3.F.2
Higher-order derivatives are represented with a variety of notations. For $y = f(x)$, notations for the second derivative include $\frac{d^2y}{dx^2}$, $f''(x)$, and y'' . Higher-order derivatives can be denoted $\frac{d^n y}{dx^n}$ or $f^{(n)}(x)$.