Calculus BC Schedule--Unit 2/Chapter 3 Derivatives

Date	Lesson	HW Assignment
8/19-8/21	Meet Your Teachers: Syllabus & Rules	Be Tech Ready!
24-Aug	Syllabus Advice from Previous Calculus Students	**Study for Summer Work Test**
25-Aug	**Summer Work TEST**	**HW1**–Video on Differentiability, p.114 #1,2,3,4
26-Aug	3.2 Differentiability	**HW2**–p.126 Quick Quiz #1,3, p.182 #53,54,55,57
27-Aug	3.2 Differentiability	**HW3**–p.115 #39,40,41, Video on Sketching Graph of f'
28-Aug	3.1 Derivative of a Function	**HW4**–p.106 #23, 26, Video on Particle Motion
31-Aug	3.4 Velocity and Other Rates of Change	**HW5**–Particle Motion Practice, Video on Speeding Up/Slowing Down
1-Sep	3.4 Velocity and Other Rates of Change	**HW6**–Video on Derivative of Vectors/Parametric Functions, p.545 #27,45ab, 48a
2-Sep	10.1 Parametric Functions, 10.2 Vectors in the Plane	**HW7**–Video on Trig Derivatives
3-Sep	3.5 Derivatives of Trigonometric Functions	**HW8**–p.146 #4,5,9,15ab,23,37
4-Sep	3.5 Derivatives of Trigonometric Functions	**HW9**–Video on Polar Coordinates, p.557 #1,3
7-Sep	**NO SCHOOL--Labor Day**	**NO Additional Homework**
8-Sep	10.3 Polar Functions	**HW10**–p. 557 #5,8, 11, 15, 17, 23
9-Sep	10.3 Polar Functions	**HW11**–Video on Slopes of Polar Curves
10-Sep	10.3 Polar Functions,10.1 Parametric Functions	**HW12**–p.557 p.558 #39,41, p.535 #7,11,23, p.561 #49c
11-Sep	*Chapter 3 REVIEW*	**HW13**–p.181 #1,3,4,7,43,46, 55,59, 65b,67ae,81, p.560 #39,49a
14-Sep	*Chapter 3 REVIEW*	**Study for TEST!**
15-Sep	**Chapter 3 TEST**	**NO Additional Homework**

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

Derivatives

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	ESSENTIAL KNOWLEDGE
FUN-2.A Explain the relationship between differentiability and continuity.	**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	ESSENTIAL KNOWLEDGE
FUN-3.B Calculate derivatives of products and quotients of differentiable functions.	**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.	**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 $f^{(n)}(x)$.
FUN-3.G Calculate derivatives of functions written in polar coordinates. **BC ONLY**	**FUN-3.G.1** Methods for calculating derivatives of real-valued functions can be extended to functions in polar coordinates. **BC ONLY**
	FUN-3.G.2 For a curve given by a polar equation $r = f(\theta)$, derivatives of r, x, and y with respect to θ, and first and second derivatives of y with respect to x can provide information about the curve. **BC ONLY**

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

LEARNING OBJECTIVE	ESSENTIAL KNOWLEDGE
CHA-3.B Calculate rates of change in applied contexts.	**CHA-3.B.1** The derivative can be used to solve rectilinear motion problems involving position, speed, velocity, and acceleration.
CHA-3.G Calculate derivatives of parametric functions. **BC ONLY**	**CHA-3.G.1** Methods for calculating derivatives of real-valued functions can be extended to parametric functions. **BC ONLY**
	CHA-3.G.2 For a curve defined parametrically, the value of $\frac{dy}{dx}$ at a point on the curve is the slope of the line tangent to the curve at that point. $\frac{dy}{dx}$, the slope of the line tangent to a curve defined using parametric equations, can be determined by dividing $\frac{dy}{dt}$ by $\frac{dx}{dt}$, provided $\frac{dx}{dt}$ does not equal zero. **BC ONLY**
CHA-3.G Calculate derivatives of parametric functions. **BC ONLY**	**CHA-3.G.3** $\frac{d^2y}{dx^2}$ can be calculated by dividing $\frac{d}{dt}\left(\frac{dy}{dx}\right)$ by $\frac{dx}{dt}$. **BC ONLY**
CHA-3.H Calculate derivatives of vector-valued functions. **BC ONLY**	**CHA-3.H.1** Methods for calculating derivatives of real-valued functions can be extended to vector-valued functions. **BC ONLY**

FUN-8
Solving an initial value problem allows us to determine an expression for the position of a particle moving in the plane.

LEARNING OBJECTIVE	ESSENTIAL KNOWLEDGE
FUN-8.B Determine values for positions and rates of change in problems involving planar motion. **BC ONLY**	**FUN-8.B.1** Derivatives can be used to determine velocity, speed, and acceleration for a particle moving along a curve in the plane defined using parametric or vector-valued functions. **BC ONLY**
	FUN-8.B.2 For a particle in planar motion over an interval of time, the definite integral of the velocity vector represents the particle's displacement (net change in position) over the interval of time, from which we might determine its position. The definite integral of speed represents the particle's total distance traveled over the interval of time. **BC ONLY**