Calculus BC Schedule -- Unit 6 Differential Equations and Mathematical Modeling

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 15	*4-Dec*	*5-Dec*	*6-Dec*	*7-Dec*	*8-Dec*
Lesson	7.1 Ordinary Differential Equations	***LATE START*** 7.2 Separable Differential Equations	7.2 Separable Differential Equations	7.3 Slope Fields/7.4 Euler's Method	7.3 Slope Fields
HMWK	**HW1**--p.543 #31,35,38,39, AP Practice #4, p.542 #21	**HW2**--p.551 #15,18,19,21, AP Practice #1,2,3	**HW3**--p.551 #22,23, AP Practice #5,9, p.569 #16b	**HW4**--p.559 #AP Practice #1,2, Calculator p.557 Graph slope field in calculator & sketch the particular solution on paper, #11,12,13,15	**HW5**--Sketch slope fields for p.557 #3a, #5a, #9a on [-1,1] by [-1,1] with table of values, AP Practice #2a, p.559 #7,9

Week 16	*11-Dec*	*12-Dec*	*13-Dec*	*14-Dec*	*15-Dec*
Lesson	7.3 Slope Fields	***LATE START*** 7.5 Logistical Model	**Unit 6 TEST (Book Chapter 7)**	*Practice for AP Practice Exam*	*Practice for AP Practice Exam / Calculus Holiday Songs*
HMWK	**HW6**--p.557 #17,18, AP Practice #1,3, p.570 AP Practice #5	**HW7**--p.566 AP Practice #1,2,4,5,6 *December IML Math Contest after school?*	**STUDY for Final (Practice AP Exam)**	**STUDY!!!!**	**STUDY!!!!**

Week 17	*18-Dec*	*19-Dec*	*20-Dec*	*21-Dec*	*22-Dec*
Lesson	**FINAL EXAMS** (1st @ 8:45am, 3rd @10:25am, Zero @ 12pm)	**FINAL EXAMS** (2nd @ 8:45am, 4th @ 10:25am)	**FINAL EXAMS** (6th @ 8:45am, 5th @ 10:25am)	**NO SCHOOL** -- Teacher Institute Day	**WINTER BREAK**
HMWK	**STUDY!!!!**	**STUDY!!!!**	**No Additional Homework**	**No Additional Homework**	**No Additional Homework**

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Unit 6: Differential Equations & Mathematical Modeling

FUN-7

Solving differential equations allows us to determine functions and develop models.

LEARNING OBJECTIVE	ESSENTIAL KNOWLEDGE
FUN-7.A Interpret verbal statements of problems as differential equations involving a derivative expression.	**FUN-7.A.1** Differential equations relate a function of an independent variable and the function's derivatives.
FUN-7.B Verify solutions to differential equations.	**FUN-7.B.1** Derivatives can be used to verify that a function is a solution to a given differential equation. **FUN-7.B.2** There may be infinitely many general solutions to a differential equation.
FUN-7.C Estimate solutions to differential equations.	**FUN-7.C.1** A slope field is a graphical representation of a differential equation on a finite set of points in the plane. **FUN-7.C.2** Slope fields provide information about the behavior of solutions to first-order differential equations.
FUN-7.C Estimate solutions to differential equations.	**FUN-7.C.3** Solutions to differential equations are functions or families of functions.
FUN-7.C Estimate solutions to differential equations.	**FUN-7.C.4** Euler's method provides a procedure for approximating a solution to a differential equation or a point on a solution curve. **BC ONLY**
FUN-7.D Determine general solutions to differential equations.	**FUN-7.D.1** Some differential equations can be solved by separation of variables. **FUN-7.D.2** Antidifferentiation can be used to find general solutions to differential equations.
FUN-7.E Determine particular solutions to differential equations.	**FUN-7.E.1** A general solution may describe infinitely many solutions to a differential equation. There is only one particular solution passing through a given point. **FUN-7.E.2** The function F defined by $F(x) = y_0 + \int_a^x f(t)\,dt$ is a particular solution to the differential equation $\frac{dy}{dx} = f(x)$, satisfying $F(a) = y_0$. **FUN-7.E.3** Solutions to differential equations may be subject to domain restrictions.
FUN-7.F Interpret the meaning of a differential equation and its variables in context.	**FUN-7.F.1** Specific applications of finding general and particular solutions to differential equations include motion along a line and exponential growth and decay. **FUN-7.F.2** The model for exponential growth and decay that arises from the statement "The rate of change of a quantity is proportional to the size of the quantity" is $\frac{dy}{dt} = ky$.
FUN-7.G Determine general and particular solutions for problems involving differential equations in context.	**FUN-7.G.1** The exponential growth and decay model, $\frac{dy}{dt} = ky$, with initial condition $y = y_0$ when $t = 0$, has solutions of the form $y = y_0e^{kt}$.
FUN-7.H Interpret the meaning of the logistic growth model in context. **BC ONLY**	**FUN-7.H.1** The model for logistic growth that arises from the statement "The rate of change of a quantity is jointly proportional to the size of the quantity and the difference between the quantity and the carrying capacity" is $\frac{dy}{dt} = ky(a - y)$. **BC ONLY** **FUN-7.H.2** The logistic differential equation and initial conditions can be interpreted without solving the differential equation. **BC ONLY** **FUN-7.H.3** The limiting value (carrying capacity) of a logistic differential equation as the independent variable approaches infinity can be determined using the logistic growth model and initial conditions. **BC ONLY** **FUN-7.H.4** The value of the dependent variable in a logistic differential equation at the point when it is changing fastest can be determined using the logistic growth model and initial conditions. **BC ONLY**