AP Calculus Curriculum Map

Mr. Reed

Month	Unit	Topics or Lessons	Objectives	Standards	Resources	Assessments	Adaptations & Modifications	Vocabulary
August	Review of Precalculus Concepts & Limits	Review of Lines Functions Trigonometry & Graphing Limits Squeeze Theorem	Students will review key topics from precalculus Students will find limits of functions using a variety of techniques (conjugates, limits approaching infinity, one-sided limits, and special trig limits)	CC.2.1.HS.F.7 CC.2.2.HS.D.1 CC.2.2.HS.D.2 CC.2.2.HS.D.3 CC.2.2.HS.D.5 CC.2.2.HS.D.6 CC.2.2.HS.D.7 CC.2.2.HS.C.1 CC.2.2.HS.C.6 CC.2.2.HS.C.7	Binder Worksheets	HW 1 – 3 HW 4 – 9 Test 1	Adaptations and modifications will be made on a class by class basis.	Linear Intercept Relation Function Domain Range Asymptote Piece-wise Limit Conjugate Infinity
September	Introduction to the TI-89 Calculator Continuity The Derivative	Getting Started with the TI-89 (solving, graphing, evaluating limits) Continuity Asymptotes for Rational Expressions Derivatives (Limit	Students will use the TI-89 graphing calculator to perform a variety of mathematical operations Students will determine function continuity Students will relate asymptotes	CC.2.2.HS.D.1 CC.2.2.HS.D.2 CC.2.2.HS.D.3 CC.2.2.HS.D.4 CC.2.2.HS.D.5 CC.2.2.HS.D.6 CC.2.2.HS.D.7 CC.2.2.HS.D.8 CC.2.2.HS.D.9 CC.2.2.HS.D.10 CC.2.2.HS.C.1 CC.2.2.HS.C.2 CC.2.2.HS.C.4 CC.2.2.HS.C.5 CC.2.2.HS.C.6	Binder Worksheets	HW 10 – 14 HW 15 – 20 Test 2 Test 3	Adaptations and modifications will be made on a class by class basis.	Continuity Rational Asymptote Derivative Rate of Change Power Rule Tangent Line Normal Line

		Definition & Power Rule) Tangent & Normal Lines Derivatives via the TI-89	with limits. Students will find the derivative via the limit definition. Students will find the derivative using the power rule. Students will write the equation of a tangent or normal line at a point. Students will find the derivative via the TI-89.					
October	Derivative Rules (Product, Quotient, Chain, Trig Derivatives) Differentiability & Continuity, Intermediate Value Theorem, Mean Value Theorem, & Rolle's Theorem	Product Rule Quotient Rule Chain Rule Trig Derivatives Differentiability Intermediate Value Theorem Mean Value Theorem Rolle's Theorem	Students will find the derivative of products and quotients of functions. Students will find the derivative of compositions of functions. Students will find derivatives involving trig functions. Students will use the IVT, MVT, and Rolle's Theorem to	CC.2.1.HS.F.2 CC.2.2.HS.D.1 CC.2.2.HS.D.2 CC.2.2.HS.D.3 CC.2.2.HS.D.4 CC.2.2.HS.D.5 CC.2.2.HS.D.6 CC.2.2.HS.D.7 CC.2.2.HS.D.8 CC.2.2.HS.D.9 CC.2.2.HS.D.10 CC.2.2.HS.C.1 CC.2.2.HS.C.2 CC.2.2.HS.C.4 CC.2.2.HS.C.5 CC.2.2.HS.C.6 CC.2.2.HS.C.7	Binder Worksheets	HW 21 – 27 HW 28 – 30 HW 31 – 36 Test 4 Test 5	Adaptations and modifications will be made on a class by class basis.	Product Rule Quotient Rule Chain Rule Composition Differentiability IVT MVT Rolle's Theorem Instantaneous Rate of Change Average Rate of Change Velocity

		Rates of Change Average & Instantaneous Velocity	solve various problems. Students will find instantaneous and average rates of change and relate these to velocities.					
November	Higher Order Derivatives & Using Derivatives for Graphing Max/Min Problems & Optimization Problems	Higher Order Derivatives Using Derivatives for Graphing Increasing/Decreasing Intervals Concave Up / Concave Down Intervals Sketching f from f' Extrema Extreme Value Theorem Optimization Problems Motion Along a Line	Students will find higher order derivatives. Students will use derivatives to sketch graphs of curves and determine intervals where functions are increasing/decreasing, as well as concavity. Students sketch a graph of the derivative of a function. Students will identify extrema. Students will perform a number of optimization problems, including those dealing	CC.2.1.HS.F.2 CC.2.1.HS.F.4 CC.2.2.HS.D.1 CC.2.2.HS.D.2 CC.2.2.HS.D.3 CC.2.2.HS.D.4 CC.2.2.HS.D.5 CC.2.2.HS.D.6 CC.2.2.HS.D.7 CC.2.2.HS.D.8 CC.2.2.HS.D.9 CC.2.2.HS.D.10 CC.2.2.HS.C.1 CC.2.2.HS.C.2 CC.2.2.HS.C.3 CC.2.2.HS.C.5 CC.2.2.HS.C.6	Binder Worksheets	HW 37 – 43 HW 44 – 50 HW 51 – 53 Test 6 Test 7	Adaptations and modifications will be made on a class by class basis.	Higher Order Derivative Increasing Decreasing Concavity Maxima Minima Relative Global Inflection Point Extrema EVT Position Velocity Acceleration Displacement Speed

			with numbers, areas, volumes, geometry, and physics. Students will solve motion along a line problems.					
December	Implicit Differentiation & Related Rates Differentials, Linear Approximation, & Antidifferentiation	Implicit Differentiation Related Rates Differentials Linear Approximation Antidifferentiation with Indefinite Integrals	Students will find derivatives implicitly. Students will solve a variety of related rates problems. Students will use differentials to solve a variety of problems, including linear approximation problems. Students will find the antiderivative of functions using indefinite integrals. Students will find the value of the constant of integration.	CC.2.1.HS.F.1 CC.2.1.HS.F.2 CC.2.1.HS.F.3 CC.2.1.HS.F.4 CC.2.1.HS.F.5 CC.2.2.HS.D.1 CC.2.2.HS.D.2 CC.2.2.HS.D.3 CC.2.2.HS.D.5 CC.2.2.HS.D.6 CC.2.2.HS.D.7 CC.2.2.HS.D.8 CC.2.2.HS.D.9 CC.2.2.HS.D.10 CC.2.2.HS.C.1 CC.2.2.HS.C.3 CC.2.2.HS.C.6	Binder Worksheets	HW 54 – 58 HW 59 – 60 HW 61 – 62 Test 8 Test 9	Adaptations and modifications will be made on a class by class basis.	Implicit vs. Explicit Differentiation Related Rate Differential Tangent Line Approximation Linear Approximation Linearization Antiderivative Antidifferentiation Indefinite Integral Integrand Variable of Integration Constant of Integration
January	Trigonometric Integrals &	Integrals of Trig Functions	Students will integration	CC.2.1.HS.F.2 CC.2.2.HS.D.1	Binder Worksheets	HW 63 – 68 HW 69 – 73	Adaptations and modifications will	u-Substitution Change of

	Integration by Substitution Integration by Separable Equations & Definite Integrals	Integration by u-Substitution Integration on the TI-89 Integration by Separable Equations The First Fundamental Theorem of Calculus & Definite Integrals Rules of Definite Integrals	Trigonometric functions Students will integrate via u-substitution. Students will integrate via the TI-89 graphing calculator. Students will integrate via separable equations. Students will use the First Fundamental Theorem of Calculus to evaluate definite integrals. Students will use rules of definite integrals to evaluate integral expressions.	CC.2.2.HS.D.2 CC.2.2.HS.D.3 CC.2.2.HS.D.4 CC.2.2.HS.D.5 CC.2.2.HS.D.6 CC.2.2.HS.D.8 CC.2.2.HS.D.9 CC.2.2.HS.C.1 CC.2.2.HS.C.2 CC.2.2.HS.C.6 CC.2.2.HS.C.7		Test 10 Test 11	be made on a class by class basis.	Variable Separable Equations First Fundamental Theorem of Calculus Definite Integral Absolute Value Function
Februa ry	Net Change, Average Value, & The Second Fundamental Theorem of Calculus Approximating Areas Under Curves & Riemann Sums Definite Integrals	Net Change Average Value The Second Fundamental Theorem of Calculus Approximating Areas using Rectangles, Trapezoids, &	Students will solve net change problems. Students will find the average value of a function. Students will apply the Second Fundamental Theorem of	CC.2.1.HS.F.2 CC.2.1.HS.F.3 CC.2.1.HS.F.4 CC.2.2.HS.D.1 CC.2.2.HS.D.2 CC.2.2.HS.D.3 CC.2.2.HS.D.4 CC.2.2.HS.D.6 CC.2.2.HS.D.7 CC.2.2.HS.D.8 CC.2.2.HS.D.9 CC.2.2.HS.D.10 CC.2.2.HS.C.1	Binder Worksheets	HW 74 – 74c HW 75 – 78 HW 79 – 82 Test 12a Test 12b	Adaptations and modifications will be made on a class by class basis.	Net Change Average Value Second Fundamental Theorem of Calculus Rectangle Inscribed Circumscribed Trapezoid Lower Sum Upper Sum Riemann Sum

	& Areas	Tables Definite Integrals & Areas (x-axis)	Calculus to problems. Students will approximate areas under curves using a variety of techniques including rectangles, trapezoids, and tables. Students will use definite integrals to find areas under and between curves (to the x-axis).	CC.2.2.HS.C.2 CC.2.2.HS.C.4 CC.2.2.HS.C.6 CC.2.2.HS.C.7 CC.2.3.HS.A.14				
March	Definite Integrals & Areas Part II Volumes of Revolutions Volumes with Cross Sections Derivatives & Integrals Involving Logarithms	Definite Integrals & Areas (y-axis) Volumes of Revolutions about an axis The Disk Method The Washer Method Volumes with Cross Sections Derivatives of Logs Integrals Resulting in	Students will use definite integrals to find areas under and between curves (to the y-axis). Students will find the volumes of solids of revolutions using the disk method. Students will find the volumes of solids of revolutions using the washer	CC.2.1.HS.F.2 CC.2.1.HS.F.4 CC.2.2.HS.D.1 CC.2.2.HS.D.2 CC.2.2.HS.D.3 CC.2.2.HS.D.4 CC.2.2.HS.D.6 CC.2.2.HS.D.7 CC.2.2.HS.D.8 CC.2.2.HS.C.1 CC.2.2.HS.C.2 CC.2.2.HS.C.4 CC.2.2.HS.C.5 CC.2.2.HS.C.6 CC.2.2.HS.C.7 CC.2.3.HS.A.13 CC.2.3.HS.A.14	Binder Worksheets	HW 83 – 83a HW 84 – 87 HW 87a – 87d HW 88 – 94 Test 12c Test 13	Adaptations and modifications will be made on a class by class basis.	Definite Integral Volume of Revolution Disk Method Washer Method Cross Section Exponential Function Inverse Logarithm Natural Logarithm "e"

		Logs	method. Students will find the volume of objects with known cross sections. Students will find derivatives of natural logarithms. Students will integrate expressions resulting in logarithms.					
April	Derivatives & Integrals of Exponential Functions Derivatives of Inverse Functions L'Hopital's Rule Exponential Growth/Decay Separation of Variables Slope Fields Accumulation Functions Review for AP Exam	Derivatives of Exponential Functions Integrals of Exponential Functions Derivatives of Inverse Functions L'Hopital's Rule Exponential Growth/Decay Separation of Variables Slope Fields Accumulation Functions	Students will find the derivative of exponential functions. Students will integrate exponential functions. Students will find the derivative of inverse functions. Students will apply L'Hopital's Rule to simplify limits of indeterminate forms. Students will solve problems	CC.2.1.HS.F.2 CC.2.2.HS.D.1 CC.2.2.HS.D.2 CC.2.2.HS.D.5 CC.2.2.HS.D.6 CC.2.2.HS.D.7 CC.2.2.HS.D.8 CC.2.2.HS.C.1 CC.2.2.HS.C.2 CC.2.2.HS.C.5 CC.2.2.HS.C.6 CC.2.2.HS.C.7 CC.2.3.HS.A.14	Binder Worksheets	HW 95 – 97 HW 104 – 108a Test 13b Test 13c	Adaptations and modifications will be made on a class by class basis	Exponential Function "e" Inverse Function Indeterminant Form L'Hopital's Rule Exponential Growth Exponential Decay Separation of Variables General Solution Particular Solution Slope Field Accumulation Function

			involving exponential growth and decay. Students will use the technique of separation of variables to solve for general solutions and particular solutions. Students will solve problems involving slope fields. Students will solve problems involving accumulation functions.					
May	Review for AP Exam Integration by Parts Rapid Repeated Integration by Parts Partial Fractions	Integration by Parts Rapid Repeated Integration by Parts Partial Fractions	Students will integrate by parts. Students will use the technique of rapid repeated integration by parts. Students will solve problems involving partial fractions.	CC.2.1.HS.F.2 CC.2.1.HS.F.4 CC.2.2.HS.D.2 CC.2.2.HS.D.6 CC.2.2.HS.D.8 CC.2.2.HS.D.9 CC.2.2.HS.C.1 CC.2.2.HS.C.3 CC.2.2.HS.C.5 CC.2.2.HS.C.6	Binder Worksheets	HW 127 – 130 HW 131 HW 132 – 133 Test 15	Adaptations and modifications will be made on a class by class basis.	Integration by Parts Partial Fractions