Allen Park High School Curriculum Map

Content Area: AP - Calculus

	Ch	Content	Skills	Benchmarks	Assessment	Essential Questions
September	Ch 0	• Preliminaries • Real numbers • Coordinates, lines	• Functions • Shifting Graphs • Trigonometric Functions	• I-1-5 • II-1-5 • II-1-3	• Summer homework. • Type 2 comments on summer assignments • Test in assignments	• How can we find the reflexive of any function respect to x-axis , y-axis, origin, and y=x
October	Ch 1	• Limits and continuity • Derivatives • Implicit Differentiation	• Rates of Change and Limits • Rules for Finding Limits • Extensions of the Limit Concept • Continuity • Derivative of a Function	• I-1-5 • I-2-1 • II-2-2 • II-2-5	• Quiz • Group activities • Type 1 if a function is defined • Chapter test	• What constant acceleration does a freely falling body experience near the surface the earth • What is the velocity of fall at any time
November	Ch 2 & Ch 3	• Applications of derivatives • Extreme values functions • The local extreme • Asymptotes and dominant terms • Optimization	• Differentiation Rules • Rates of Change • The Chain Rule • Related Rates of Change • The Mean Value Theorem	• I-2-1 • II-1-1 • II-1-2 • II-1-7 • II-3-5 • II-3-6	• Type 2 properties of first derivatives • Quiz and Test	• Why machinery breaks when you run it too fast • How rapidly will the fluid level inside a vertical cylindrical tank drop if we pump the fluid at the rate of constant • How long will it take a specific percentage of the ice cube to melt? • On a highway chase, how can a police cruiser determine the speed of a speeding car.
December	Ch 4	• Integrations • Properties, area and the MVT • Estimating with finite sum	• Optimization • Indefinite Integrals • Integration by Substitution • Riemann Sums • The Mean Value Theorem The Fundamental Theorem • Substitution in Definite Integrals • Numerical Integration	• II-1-3 • II-1-5 • II-2-5	• Graphing calculator • Type 2 strategy for solving any related rate problem • Quiz • Type 3 the four sister race • Test	• How large should the squares cut from the corners be to make the box hold as much as possible • You have been asked to design a 1-L oil can like a right circular cylinder, what dimensions will use the least material • What is the least expensive shape for an oil can • What is the stiffest beam we can cut from 12-inch log
January	Ch 5	• Applications of integrals	• Areas between Curves	• II-1-1	• Take home quiz from	• Why is the volume of a

		• Finding volumes of rotation around any lines parallel to x or y axes. • Comparing disk, washer and shell • Methods.	• Finding Volumes by Slicing • Volumes of Solids • Cylindrical Shells	• II-1-4 • II-1-7I-2-3	ap test questions • Test on Chapter 5	sphere with radius r is $v=4/3(3.14)r^3$ • How fast a space vehicle needs to be going at a certain point to escape the earth's gravitational field or to predict the useful life a span of a radioactive material • How do you define and calculate the area of the region between the graphs of two continuous functions? • How do you define and calculate the volumes of solids by the method of slicing • How are the disk and washer methods for calculating volumes derived from the methods of slicing? •
February	Ch 6	• Transcendental Functions • First order differential equations.	• Inverse Functions • Natural Logarithms • a^x and $\log_a x$ • Growth and Decay • L'Hopital's Rule	• I-2-3 • IV-3-4 • I-2-2 • IV-1-4	• Test on Chapter 6	• In about how many years will human teeth be 90% of their present size? • What will be our descendant's tooth size 20,000 years from now? • How many years will it take an amount of money to double when invested at r percent compounded? •
March	Ch 6 & Ch 7	• Relative Rates of Growth • Inverse Trigonometric Functions • Derivatives of Inverses • Basic integration formulas.	• Relative Rates of Growth • Inverse Trigonometric Functions • Derivatives of Inverses • Trigonometric functions	• I-2-3	• Open ended review • Group study • Test on each group	• How far from the taller building should you place the station to maximize the number of hours it will be in the sun on a day when the sun passes directly overhead? • How many seconds after the switch in an RL circuit is closed will it take the current i to reach half of its steady state value?
April	•	• Review for AP test	• Multiple Choice and Open	•	• Three hours AP	•

			Ended Questions		Practice Test • Group leader points	

May	• Review	• Multiple Choice and Open Ended Questions	•	•	• Based on previous AP Tests
June	• Integration by Parts	• Integration by Parts • Partial Fractions • Trigonometric Substitutions • Improper Integrals	•	• Test on integration by part • Test on partial fraction	•