



CURRICULAR · MATH

AP Calculus

A twelve-month AP Calculus programme of eight six-week belts that moves from limits and continuity, through differentiation and its applications, to integration, differential equations, and area and volume, with a review and assessment sprint closing every belt.

8 belts

52 topics

Grade 12

Completes in 12 Months

○ White Belt 1

Arena 1 · 6 Weeks

1. Estimating Limit Values From Graphs & Tables
2. Limits of Combined & Composite Functions
3. Limits By Direct Substitution
4. Limits Of Trigonometric & Piecewise Functions
5. Limits By Factoring, Rationalizing & By Pythagorean Identity
6. Review/Assessment

○ White Belt 2

Arena 1 · 6 Weeks

1. Selecting Procedures For Determining Limits
2. Squeeze Theorem & Intermediate Value Theorem
3. Discontinuities - Defining Continuity At A Point & Removing Discontinuities
4. Limits At Infinity & Horizontal Asymptotes
5. Defining the derivative of a function at a point and as a function
6. Review/Assessment

● Yellow Belt 1

Arena 2 · 6 Weeks

1. Connecting differentiability and continuity
2. Determining derivatives for elementary functions
3. Applying differentiation rules
4. The chain rule for differentiating composite functions
5. Implicit differentiation
6. Review/Assessment

● Yellow Belt 2

Arena 2 · 6 Weeks

1. Differentiation of general and particular inverse functions
2. Determining higher-order derivatives of functions
3. Identifying relevant mathematical information in verbal representations of real-world problems involving rates of change
4. Applying understandings of differentiation to problems involving motion
5. Generalizing understandings of motion problems to other situations involving rates of change
6. Review/Assessment

Green Belt 1

Arena 3 · 6 Weeks

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|---|---|
| 1. Solving related rates problems | 5. Derivatives and properties of functions |
| 2. Local linearities and approximation | 6. First derivative test, second derivative test, and candidates test |
| 3. L'Hospital's rule | 7. Review/Assessment |
| 4. Mean Value Theorem and Extreme Value Theorem | |

Green Belt 2

Arena 3 · 6 Weeks

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| 1. Sketching graphs of functions and their derivatives | 4. Using definite integrals to determine accumulated change over an interval |
| 2. Solving optimization problems | 5. Approximating integrals using Riemann Sums |
| 3. Behaviors of Implicit relations | 6. Accumulation functions |
| | 7. Review/Assessment |

Blue Belt 1

Arena 4 · 6 Weeks

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| 1. The Fundamental Theorem of Calculus, and definite integrals | 5. Sketching slope fields and families of solution curves |
| 2. Antiderivatives and indefinite integrals | 6. Solving separable differential equations to find general and particular solutions |
| 3. Properties of integrals and integration techniques | 7. Review/Assessment |
| 4. Interpreting verbal descriptions of change as separable differential equations | |

Blue Belt 2

Arena 4 · 6 Weeks

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| 1. Deriving and applying a model for exponential growth and decay | 4. Solving accumulation problems |
| 2. Determining the average value of a function using definite integrals | 5. Finding the area between curves |
| 3. Modeling particle motion | 6. Determining volume with cross-sections, the disc method, and the washer method |
| | 7. Review/Assessment |