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Tackling Topic 5: Calculus in the IB® Mathematics Curriculum

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Agenda

- » **Welcome & Introductions**
- » **Topic 5, what was new in the curriculum**
- » **Items that stood out from the May 2021 Exam Session**
- » **How successful were topics from Calculus when used on the Math Exploration IA.**
- » **Topic 5 Handheld Tips and Tricks for success in IB**
- » **What's new/updated on the TI/IB Website**
 - » **Bounded Areas, Graphing Relationships, Investigating the Derivatives of Some Common Functions, Taylor Polynomials**
- » **What we are currently working on for the TI/IB Website**
 - » **Profit Equations and Calculus**
- » **Suggestions for future Topic 5 activities**





Topic 5: Calculus, what was new in the curriculum (as compared to Studies and Math SL/HL)

» Applications and Interpretations

- » **From Math SL:** Intro to the concept of limit, Intro to integration as anti-differentiation, Definite integrals using technology, Areas between a curve and x-axis, Anti-differentiation with a boundary condition to determine a constant
- » **New:** Approximating areas using the trapezoidal rule
- » **From Math SL for HL only:** Derivatives of Trig, e, and logs, Chain, product, quotient rules, Related rates, Second derivative and its test, Indefinite Integration, U-sub, Area of region enclosed by x or y-axis, Volume of revolution, Kinematics
- » **From Math HL Options:** Differential equations, Solving by separation of variables, slope fields, Euler's method
- » **New:** Phase portrait for the solutions of coupled differential equations

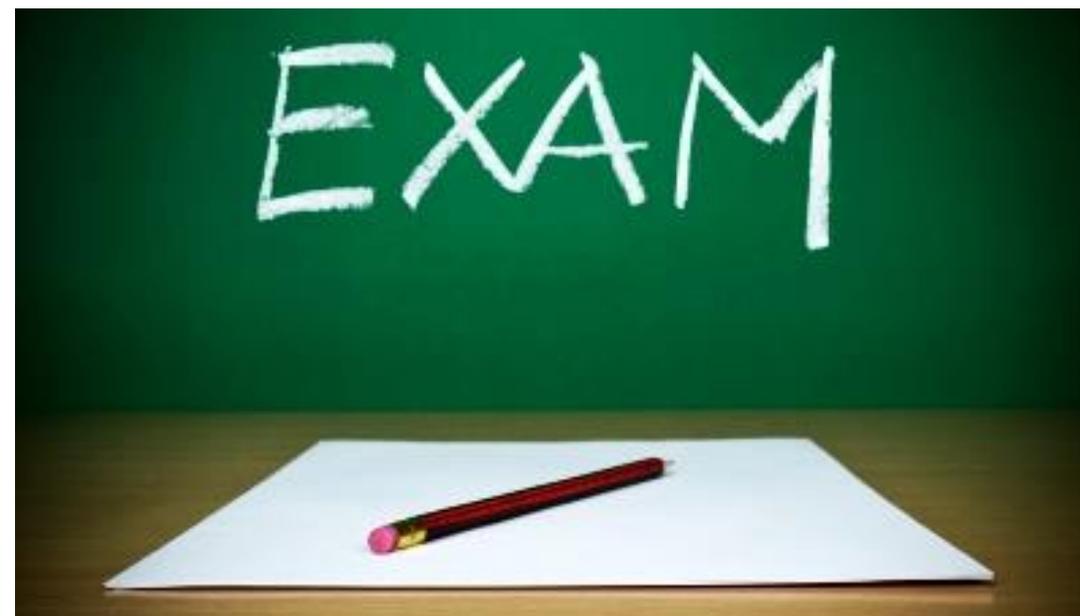
» Analysis and Approaches

- » **From Math Studies for SL:** Derivative as gradient function and as rate of change, Increasing and decreasing and their graphical relationships, power rule, tangents and normal
- » **From Math HL Options for HL:** l'Hopital's Rule, First order differential equations, Euler's method, Maclaurin series
- » **New for HL:** Derivatives and integrals of all trig functions and their inverses, partial fractions to integrate



Items that stood out from the May 2021 Exam Session

- AI Paper 1: derivatives and optimization (SL), integration and profit changes (SL), differential equations and related rates (HL), slope fields (HL)
- AI Paper 2: trapezoid rule and area under a curve (both SL and HL), optimization (SL), volume of revolution (HL), kinematics (HL)
- AI Paper 3: derivatives, Euler, differential equations
- AA Paper 1: tangents (SL), 2nd derivatives and increasing/decreasing (SL), area under a curve (SL), kinematics (SL), 2nd derivative and Maclaurin series (HL), l'Hopital's (HL), kinematics and differential equations (HL), integration of trig functions (HL)
- AA Paper 2: integration and finding the constant (SL), POI and maximum/minimum (HL)





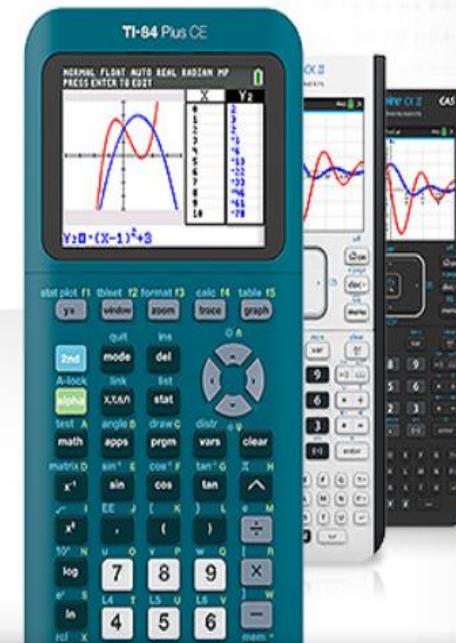
What is New on the TI Website?

- » <https://education.ti.com/en> or
- » <https://education.ti.com/en/ib>
- » **New activities**
 - » **Sampling Techniques**
 - » **Bounded Areas**
 - » **t-Test**
 - » **Voronoi Diagrams**
- » **Updated Activities**
 - » **Binomial PDF, Chi-Squared Tests, Compound Interest, Derivatives and Their Graphs, Correlation, Taylor Polynomials, Investigating Derivatives of Common Functions**
- » **New Exam Style Questions**

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What are we currently working on?

- » <https://education.ti.com/en> or
- » <https://education.ti.com/en/ib>
- » **New activities**
 - » **Angle of Elevation and Depression**
 - » **Finding the Inverse, Domain and Range of a Function**
 - » **3D Surface Area and Volume**
 - » **Integration and Differentiation using Profit Equations**
- » **Updating activities**
 - » **Circles (Angles and Arcs), Properties of Logs, Trig Ratios, Which Garage is Better?, Geometric and Arithmetic Sequences and Series, Exponential Growth and Decay**

Resources for IB® Diploma Programme mathematics teachers

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- » Breadth and depth of knowledge



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Analysis and Approaches

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Applications and Interpretation

Get activities that support core concepts for Mathematics: Applications and Interpretation.

Suggestions for Future Topic 5 Activities

In the chat window or sent to my email address wilkiedan@gmail.com, what topics would you like activities and questions created for?

What I have heard so far:

- Standard Normal Distribution
- Algebraic Proof
- Amortization
- Kinematics
- Solving Trig Equations
- Calculus in real life

