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Professional Development from Texas Instruments

# Tackling Topic 3: Geometry and Trigonometry in the IB® Mathematics Curriculum

education.ti.com/webinars

Texas Instruments

# Agenda

- Welcome & Introductions
- Topic 3, what was new in the curriculum
- Items that stood out from the May 2021 Exam Session
- How successful were topics from Functions when used on the Math Exploration IA.
- Topic 3 Handheld Tips and Tricks for success in IB
- What's new/updated on the TI/IB Website
  - Voronoi Diagrams, Surface Area and Volume, Angles of Elevation and Depression
- What we are currently working on for the TI/IB Website
  - I am currently working on updated two Topic 3 activities (Circles: Angles and Arcs, Trig Ratios)
- Suggestions for future Topic 3 activities

# Topic 3: Geometry and Trig, what was new in the curriculum (as compared to Studies and Math SL)

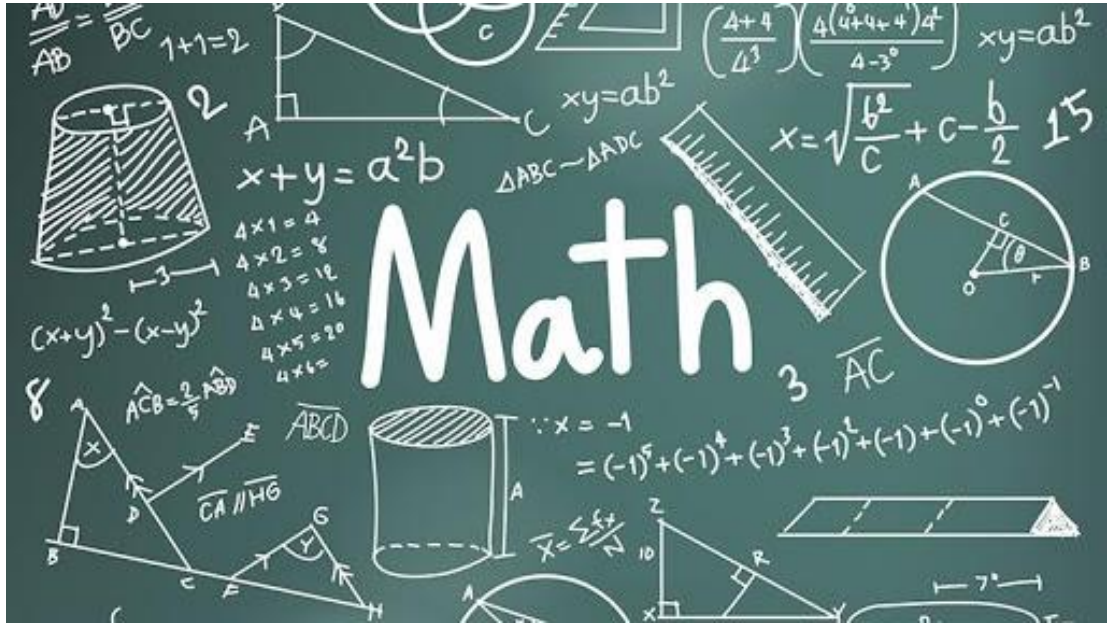
- Applications and Interpretations
  - Circles: Arc Length and Area of Sector
  - Equations of Perpendicular Bisectors
  - Voronoi Diagrams
  - Geometric Transformations involving Matrices (HL only)
- Analysis and Approaches (from Math Studies)
  - Distance between two points in 3D, Midpoint in 3D
  - Volume and Surface Area in 3D
  - Angles between lines and between a line and a plane
  - Angles of elevation and depression
  - Right Triangle Trig, Sine and Cosine Rule, Area of Triangle using Trig

# Items that stood out from the May 2021 Exam Session

- Volume of a sphere (with scientific notation AA), Surface Area and Volume of a half sphere (AI)
- Trig Identities (AA)
- Trig Functions and Ferris Wheels (AA)
- Trig Function Graphs (with particle motion AA)
- Arc Length and Area of Sector (AA and AI)
- Rule of Sines and Bearings (AA)
- Voronoi Diagrams (AI)
- Area of a Triangle with Trig (AI)

# How Successful were Topics from Geometry and Trigonometry when used for the Math Exploration IA

- Volume/Surface Area (with and without Calculus)
- 1 Voronoi Diagram
- Modelling Trig Functions
- Vectors (HL)



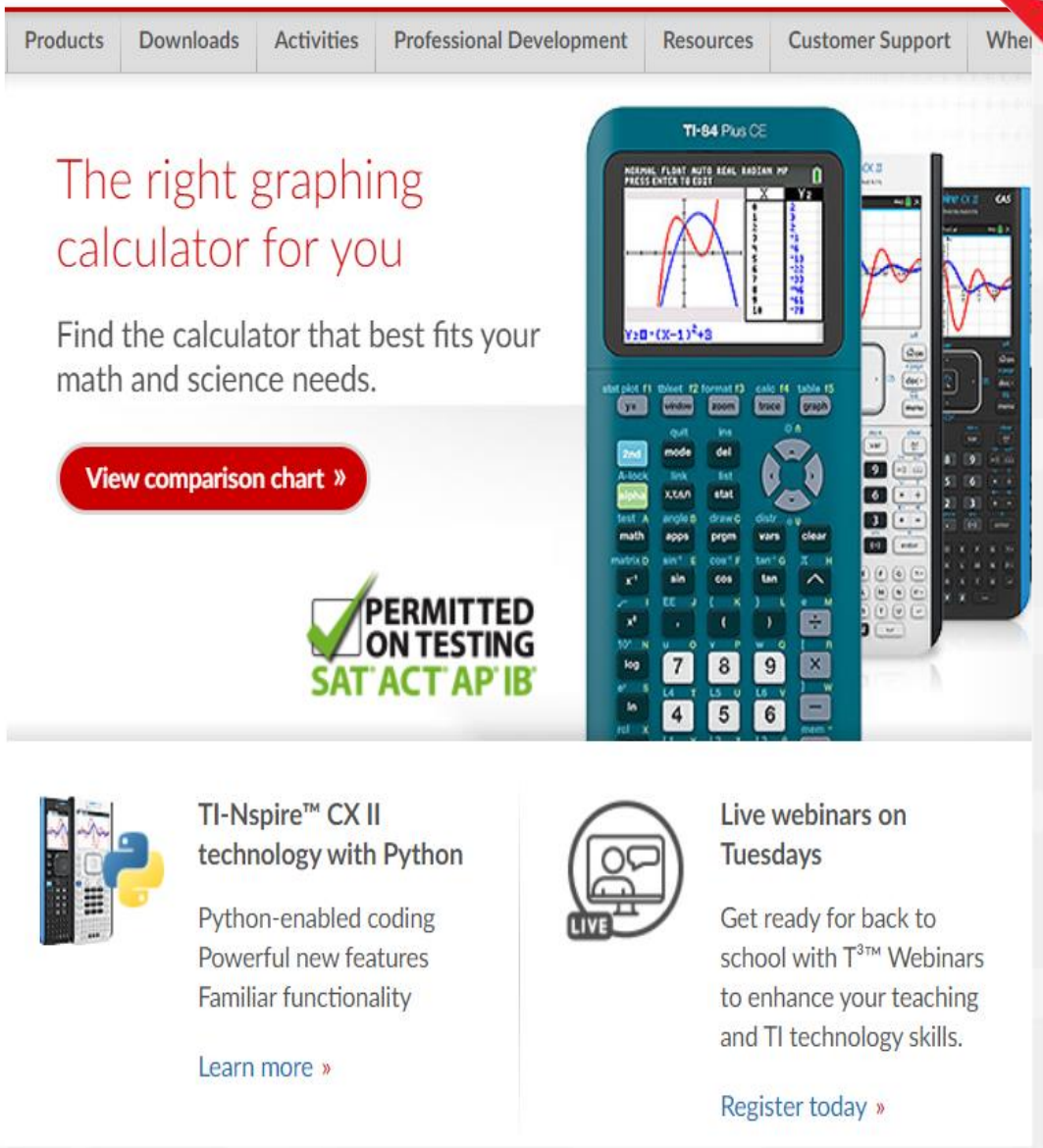
# Topic 3 Handheld Tips and Tricks for Success in IB

## For the TI Nspire CX II and the TI-84 Plus CE

- Basic Calculations for Surface Area and Volume
- Easily converting between Deg and Rad when graphing, finding arc lengths and area of sectors, using Sin and Cos rules, and angles of elevation and depresssion
- Modeling Data for Trig Functions
- Graphing Trig Functions
- Constructing Voronoi Diagrams (activity)
- Verifying Trig Identities

# 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



# 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

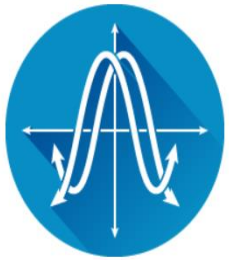
## Resources for IB® Diploma Programme mathematics teachers

Support student success for the new International Baccalaureate® (IB®) Diploma Programme mathematics curricula using Texas Instruments (TI) resources.

TI activities and webinars help strengthen:

- Mastery of concepts and principles
- Logical, critical and creative thinking
- Breadth and depth of knowledge

## Explore free activities



### Analysis and Approaches

Get activities that support core concepts for Mathematics: Analysis and Approaches.

### Applications and Interpretation

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

# Suggestions for Future Topic 3 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