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Tackling Topic 4: Statistics and Probability in the IB® Mathematics Curriculum

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Agenda

- Welcome & Introductions
- Topic 4, what was new in the curriculum
- Items that stood out from the May 2021 Exam Session
- How successful were topics from Statistics and Probability when used on the Math Exploration IA.
- Topic 4 Handheld Tips and Tricks for success in IB
- What's new/updated on the TI/IB Website
  - Binomial Eye Color, Does a Correlation Exist?, Sampling Techniques, t-Test, The Chi-Squared Test,
- What we are currently working on for the TI/IB Website
  - I am not working on Topic 4 at this time
- Suggestions for future Topic 4 activities

Topic 4: Statistics and Probability, what was new in the curriculum (as compared to Studies and Math SL/HL)

- Applications and Interpretations
  - Reliability of data sources and bias in sampling
  - Sampling techniques and their effectiveness
  - Binomial distribution and mean/variance of binomial distribution (from Math SL)
  - Spearman's r
  - Awareness of appropriateness and limitations of Pearson's and Spearman's r and affect on outliers of each
  - Chi-squared goodness of fit test
  - t-Test
  - Use of p-value in comparison of the means of two populations
  - Use of one tail and two tailed tests
  - R squared, non-linear regression, reliability and validity tests (HL only)

- Analysis and Approaches (from Math Studies)
  - Many the same is the AI additions
  - Equations of the regression lines of x on y
  - Use of equation for prediction purposes

Items that stood out from the May 2021 Exam Session

- On an AA Paper 1, incredibly difficult box and whisker question involving upper/lower quartiles and outliers
- Challenging (and long) AA Paper 1 question on biased dice and probability distributions and expected values
- Straight forward regression problem (AA) *Use a straightedge!!
- Normal distribution and probability (AA)
- Justification of data found on a box and whisker (AI)
- First use of t-Test on AI exam, interesting results
- Difficulties writing the conclusion for the goodness of fit test, how to use the words mean and population (AI)
- Questions that were used for both SL and HL (AA and AI)

How Successful were Topics from Statistics and Probability when used for the Math Exploration IA

- Scatter plot, r-value, linear regression, interpolation and extrapolation
- Chi-Squared test
- Basic stats (mean, median, mode, standard deviation)
- Other forms of regression
- A few probability type papers

Topic 4 Handheld Tips and Tricks for Success in IB

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

- Let’s explore the Nspire Probability Menu
- Let’s explore the Nspire Statistics Menu
- How to do the same things on the 84
- Modelling from data in lists
- Types of graphs you can create

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

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TI activities and webinars help strengthen:

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

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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 4 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