CAISL
Carlucci American International School of Lisbon

GRADE 12 FUNCTIONS, STATISTICS, AND TRIGONOMETRY - IB MATH STUDIES YEAR 2 FRAMEWORK

Contents

INTRODUCTION

This class prepares students to solve problems in a variety of ways, reason and extend their critical thinking skills. Greater focus is given to analysis skills and application, than performing routine operations. An emphasis on applications of mathematics and the largest section is on statistical analysis. This class prepares students to solve problems in a variety of ways, reason and extend their critical thinking skills. Greater focus is given to analysis skills and application, than performing routine operations.

PRIOR LEARNING TOPICS

It is expected that all students have extensive previous mathematical experiences, but these will vary.
In order to enroll in year two, students are expected to have successfully completed year 1 or an equivalent course.

EXPECTATIONS

INFORMATION TECHNOLOGY EXPECTATIONS

Graphic Display Calculator and Computer

Students are expected to use a graphic display calculator both in class and during assessments. The math department recommends the use of the TI – 84 plus model.

Students are also expected to use Geogebra or Excel to produce graphical representations or table of values. (https://www.geogebra.org/?lang=pt-PT)

PERFORMANCE INDICATORS

MATH PRACTICES

Explanations of Math Practices: By the end of the year students will be expected to problem solve, reason mathematically, and communicate efficiently according to grade level expectations. See link below: https://www.caislisbon.org/uploaded/Curriculum_links/Math/Math_Practice_Progressions_5-12.pdf

PROBLEM SOLVING

Make sense of problems and persevere in solving them
Look for and make use of structure (Deductive Reasoning)
Look for and express regularity in repeated reasoning (Inductive Reasoning)

MATHEMATICAL REASONING, COMMUNICATION, AND MODELING

Reason abstractly and quantitatively
Construct viable arguments and critique the reasoning of others
Model with mathematics
Use appropriate tools strategically
Attend to precision

MATH CONCEPTS

The student identifies, manipulates and classifies numbers. (Number and Number Sense)
Define basic terms and notation of logic.
Apply logic operators to multiple propositions and complete truth tables.
Understand and apply the concept of implication and its inverse, converse and contrapositive.
The student develops, chooses and uses appropriate methods to solve problems. (Computation/ Estimation)
N/A
The student has a developed sense of spatial awareness. (Geometry)

N/A

The student finds associations between two variables and represents these algebraically and graphically. (Functions)

Understand the concept of a limit and then use first principles to determine the derivative of a function.
Apply the Power and Sum rules to take the derivative of various functions.
Determine the equation of a tangent line at a given point as well as the point where a certain gradient occurs.

The student collects, analyzes and represents real world data, and analyzes chances of random occurrences. (Probability and statistics)

Visually represent and analyze data on frequency and cumulative frequency histograms, stem and leaf plots and box and whisker plots.
Calculate and analyze measures of central tendency (mean, median and mode) and measures of spread (standard deviation, quartiles and percentiles) from raw data and cumulative frequency graphs with or without a graphic calculator.
Draw scatter plots and analyze the relationship between the two variables by eyeing the data and using the r and r2 value.
Determine the equation of the line of best fit for the data and use it to make predictions.
Perform the Chi-squared test on data sets to determine if two variables are dependent on each other.
Understand and apply the basic notation of Venn diagrams and set theory.
Determine basic theoretical probability.
Determine the probability of and, or and conditional probability events and use tree, Venn and dot diagrams to solve probability problems.
Distinguish between independent and mutually exclusive events.

The student quantifies the world around him/her. (Measuring)

N/A

ASSESSMENT

For students to receive a credit towards their High School Diploma, they must demonstrate proficiency on:

Summative assessments set by the class teacher which may take the form of

- in-class or out-of-class projects
- tests and quizzes which assess both knowledge and skill acquisition
- A final exam at the end of the year which covers material from the syllabus

Students who are pursuing the IB Diploma in addition to the High School Diploma must complete both years of the program and will submit the following works to the IBO which will assess them and determine the IB score awarded to the students for the IB Mathematics Standard Level course.

- In Year 2: produce an Internal Assessment (I.A.) which is a student initiated exploration which expands upon material covered in the syllabus and takes the form of a paper around 10 to 15 pages. The Internal Assessment is sent to the IBO for assessment and counts for 20% of the final IB Math SL grade.
- End-of-Course Exams written and scheduled by the IBO and administered at CAISL.

FURTHER EXPECTATIONS

Notebook
Math notebooks are an independent responsibility of the student. Students are expected to keep an organized notebook with notes from class, work done at home.

Scientific Writing
Students are expected to use the equation tool from word office to write all mathematical notation.