

Year 11 — Full learning objectives

45 objectives across 4 units · MYP Year 5

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UNIT 1

11.1 Conditional Probability

Sets and Venn Diagrams

1. I can identify number sets, understand interval notation, subsets and complements.
2. I can use Venn diagrams to represent union and intersection of sets, and solve related problems.

Probability

3. I can understand experimental and theoretical probability.
4. I can determine sample spaces; use compound events with tree diagrams and two-way tables.
5. I can understand and calculate conditional probability.
6. I can identify and test for mutually exclusive and independent events.

Counting Techniques

7. I can understand factorial notation, permutations and combinations. (enrichment)

11.2 Transformation of Functions and Algebra

Functions

1. I can understand the definition of a function and a relation; use domain and range.
2. I can apply the vertical line test to determine if a relation is a function.
3. I can use function notation.
4. I can determine inverse functions and use composite functions (fog notation). (extension)
5. I can explore absolute value function and square root function. (enrichment)
6. I can explore Euler's number e . (enrichment)

Quadratic Functions

7. I can use vertex form of quadratic equations.
8. I can factorise quadratic expressions and solve quadratic equations.
9. I can complete the square and convert between forms of quadratic equations.
10. I can use GDC to explore quadratic features: intercepts, axis of symmetry, vertex, and optimisation.
11. I can solve real-world quadratic modelling problems.
12. I can introduce transformations via vertex form.
13. I can use the discriminant to determine the nature of roots. (extension)

Transformations

14. I can perform horizontal and vertical translations, stretches and reflections — both graphically and algebraically.

Exponential and Logarithmic Functions

15. I can apply index laws for rational indices. (extension)
16. I can understand the shape of an exponential function and identify key intercepts and asymptote.
17. I can explore exponential graph transformations.
18. I can solve real-life problems involving exponential growth, decay, depreciation and compound interest; interpret contextual meaning of parameters.
19. I can use technology to solve basic exponential equations.
20. I can explore logarithms: log equations, the log function, and log laws. (extension)

11.3 Surveying and Navigation

Prerequisites

1. I can apply angle and line rules; use right-angled trigonometry and Pythagoras' theorem, including problem-solving, converse, and 3D.
2. I can use bearings; calculate triangle area; solve 3D problems.

Non-Right-Angle Trigonometry

3. I can apply the sine rule, cosine rule, and area-of-triangle formula to solve problems.
4. I can solve problems involving the ambiguous case of the sine rule. (extension)
5. I can prove the sine rule and cosine rule. (enrichment)

Unit Circle

6. I can calculate arc length, sector area and segment area in degrees.
7. I can understand radian measure and the full unit circle. (extension)
8. I can use negative and complementary angle identities, the Pythagorean identity, and $\sin x / \cos x = \tan x$. (extension)
9. I can use special triangles to find exact trigonometric values at multiples of π . (extension)
10. I can solve trigonometric equations. (extension)
11. I can calculate arc length, sector and segment area in radians. (extension)

Trigonometric Modelling

12. I can identify periodic behaviour and model it using sine and cosine functions.
13. I can fit trigonometric models to data.
14. I can explore the tangent function. (enrichment)

11.4 DP Course Taster

Systems of Equations

1. I can apply systems of equations to fit model coefficients using technology.

Algebra

2. I can review algebraic simplification and solving linear equations.
3. I can work with algebraic fractions.

Mini-IA Project

4. I can complete a Mini-IA project (e.g. fitting curves to basketball shots and bouncing balls), demonstrating mathematical modelling in a real-world context.
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