Mathematics

List of topics:

1. Exponents and logarithms.

Index laws, rational indices, basic exponential equations, logarithms, laws of logarithms, the change of base rule, basic logarithmical equations.

2. Functions. Transformations of functions.

Relations and functions, function notation, domain and range, rational functions, composite functions, inverse functions, transformations of functions: translations, stretches, reflections, miscellaneous transformations, the graph of $y=1f(x)$.

3. Quadratic function.

Different forms of a quadratic functions, graphs of quadratic functions, using the discriminant, finding a quadratic from its graph, the intersection of graphs, problem solving with quadratics, optimisation with quadratics, quadratic equations and inequalities.

4. Sequences and series.

Number sequences, arithmetic and geometric sequences, growth and decay, series, arithmetic series, finite and infinite geometric series, financial mathematics.

5. Trigonometry.

Trigonometric ratios, inverse trigonometric ratios, multiples of $\pi 3, \pi 4, \pi 6$, true bearings, the area of a triangle, cosine rule, sine rule, the angle between a line and a plane, angle of depression and elevation, arc length and sector area, problem solving with trigonometry, radian measure, the unit circle, The Pythagorean identity.

6. Probability and statistics.

Experimental and theoretical probability, making predictions using probability, the addition law of probability, independent and dependent events, conditional probability, simple and grouped discrete data, continuous data, measuring the centre of data, measuring the spread of data, using frequency tables, box and whisker diagrams, parallel box and whiskers diagrams, outliers, cumulative frequency graphs, variance and standard deviation.