

Activity 1

- 1.1 Laws of indices for all rational exponents.
 - 1.2 Use and manipulation of surds. Students should be able to rationalise denominators.
 - 1.3 Quadratic functions and their graphs.
 - 1.4 The discriminant of a quadratic function.
 - 1.5 Completing the square. Solution of quadratic equations. Solution of quadratic equations by factorisation, use of the formula, use of a calculator and completing the square.
 - 1.6 Solve simultaneous equations; analytical solution by substitution.
 - 1.7 Interpret linear and quadratic inequalities graphically.
 - 1.8 Represent linear and quadratic inequalities graphically. Represent linear and quadratic inequalities graphically. Shading and use of dotted and solid line convention is required.
 - 1.9 Solutions of linear and quadratic inequalities.
 - 1.10 Algebraic manipulation of polynomials, including expanding brackets and collecting like terms, factorisation. Factorisation of polynomials of degree n , $n \leq 3$. The notation $f(x)$ may be used.
 - 1.11 Graphs of functions; sketching curves defined by simple equations. Geometrical interpretation of algebraic solution of equations. Use of intersection points of graphs of functions to solve equations. Functions to include simple cubic functions and the reciprocal functions
Knowledge of the term asymptote is expected.
- Also, trigonometric graphs.
- 1.12 Knowledge of the effect of simple transformations on the graph of $y = f(x)$ as represented by $y = af(x)$, $y = f(x) + a$, $y = f(x + a)$, $y = f(ax)$.
- Students should be able to apply one of these transformations to any of the above functions (quadratics, cubics, reciprocals, sine, cosine, and tangent) and sketch the resulting graphs. Given the graph of any function $y = f(x)$, students should be able to sketch the graph resulting from one of these transformations.
- 2.1 Equation of a straight line, including the forms $y - y_1 = m(x - x_1)$ and $ax + by + c = 0$
 - 2.2 Conditions for two straight lines to be parallel or perpendicular to each other
 - 3.1 The sine and cosine rules, and the area of a triangle in the form $\frac{1}{2} ab \sin C$.
 - 3.2 Radian measure, including use for arc length and area of sector.
 - 3.3 Sine, cosine and tangent functions. Their graphs, symmetries and periodicity.
 - 4.1 The derivative of $f(x)$ as the gradient of the tangent to the graph of $y = f(x)$ at a point; the gradient of the tangent as a limit; interpretation as a rate of change; second order derivatives
 - 4.2 Differentiation of x^n , and related sums, differences and constant multiples.
 - 4.3 Applications of differentiation to gradients, tangents and normals.
5. Integration