Mathematics Curriculum Year 5

- **Functions:**
  - Different ways of representing functions (using functional notation, table of values, graphs)
  - Functions and relations
  - Domain and range of functions / relations
  - Discussing the monotonic behaviour of functions for given intervals
  - One-to-one (bijective) and many-to-one functions
  - Review on linear functions, finding the equation of a straight line through two points using different methods, point check
  - Homogeneous and inhomogeneous linear functions, direct proportionality

- **Systems of two linear equations with two unknowns:**
  - Review on different methods for solving systems of two linear equations (one graphical and three algebraic methods)
  - Solving systems of linear equations containing algebraic fractions
  - Word problems

- **Simple transformations of functions:**
  - Translations parallel to the x- and y- axis
  - Stretch transformations (vertical and horizontal stretch)
  - Reflections about the x- and y-axis
  - Combinations of all transformations

- **Reciprocal function and rational functions:**
  - Determining the equations of the asymptotes of rational functions, graphing rational functions
  - Transformations of the reciprocal function

- **Quadratic equations and functions:**
  - Different types of quadratic equations
  - Zeros (roots) of quadratic equations (functions)
  - Different methods for solving quadratic equations:
    solving by factorization
    solving by completing the square
    solving by using the quadratic formula
    solving by using your GDC (graphing feature, polynomial root finder)
  - Deriving the quadratic formula
  - The meaning of the discriminant
  - Graphing quadratic functions with and without using your GDC (standard form, turning point form, factorized form)
  - Finding the equation of a quadratic function from its graph (with and without GDC)
  - Stating and applying Vieta´s theorem
  - Applications of quadratics: word problems involving quadratic equations

- **Right-angled triangle trigonometry:**
  - Definition of the trigonometric ratios in a right-angled triangle
  - Exact values of the trigonometric ratios for some special angles, complementary angle proposition
  - Angles of elevation and depression – surveying problems using right-angled triangles
  - Compass points and compass (true) bearings using right-angled triangles
  - The unit circle and the definition of the basic trigonometric functions on the unit circle, polar coordinates
  - Linking the trigonometric functions and the gradient of a straight line

- **Non right-angled triangle trigonometry:**
  - Deriving and applying the sine and the cosine rule
  - Word problems involving the sine and the cosine rule
  - The ambiguous case
  - Word problems involving compass (true) bearings
  - Radian measure and conversions between degrees and radians (and vice versa)
  - Calculating the arc length and the area of a sector and a segment of a circle
  - Finding the area of triangles using trigonometric ratios
  - 3-dimensional problem solving

- **The definition of basic trigonometric ratios on the unit circle:**
  - Extending the unit circle to all four quadrants: periodicity of trigonometric ratios, angle of any magnitude
  - The quadrant rule, signs of trigonometric ratios
  - Trigonometric reduction formulae

- **Trigonometric equations:**
  - Using the unit circle for solving trigonometric equations
  - Solving trigonometric equations involving the standard trigonometric identities
  - Solving trigonometric equations involving compound angles, multiple angles, and powers of trigonometric functions