

Curriculum Basics Year 4

Algebra:

- Revisiting the number systems, introducing the irrational and real numbers
- defining square roots, rules for square roots, simplifying square roots
- rationalizing the denominator
- cube roots, word problems
- interval and set notation (also using the absolute value sign), representing intervals on the number line
- estimating errors (absolute, relative and percentage error)
- linear equations
 - solving by changing into equivalent equations
 - distinguishing between 3 possible cases (no solution, 1 solution, infinite solution)
 - word problems involving equations
- rearranging formulae
- inequalities
 - solving inequalities, using the interval notation and graphing the solution on the number line
 - solving word problems involving inequalities
- special binomial products (revision and new formulae)
- rational expressions (algebraic fractions):
 - algebraic fractions: definition and terminology
 - finding the domain of algebraic fractions
 - factorizing, expanding and reducing algebraic fractions
 - addition and subtraction of algebraic fractions
 - multiplication and division of algebraic fractions
 - combining all four operations, order
- equations involving algebraic fractions:
 - finding the domain of an equation
 - solving by changing into equivalent equations
 - finding the solution set, checking the solution
- functions:
 - relating graphs to physical phenomena, interpreting graphs
 - interpreting distance-time graphs, calculating the average velocity and the velocity for a given time interval
 - equations of straight lines - linear homogeneous and inhomogeneous functions:
 - sketching graphs using different methods (table of values, point and gradient)
 - determining the gradient angle and the gradient of a line from the graph of the line
 - matching graphs to equations of linear functions

Geometry:

- the intercept theorem and proportions
- the Pythagorean theorem
- applying the Pythagorean theorem to plane shapes:
 - rectangle and square
 - isosceles and equilateral triangle
 - parallelogram and rhombus
 - isosceles trapezium
 - kite (deltoid)
- the circle
 - circumference of the circle, the number π
 - length of an arc, central angle, applications to geography
 - area of the circle
 - circumference and area of a sector
 - circumference and area of an annulus
 - word problems
- three-dimensional shapes: cylinder, cone, and sphere
 - formulae for the volume and the surface area (curved area) of these figures
 - applying the formulae to text problems
- three-dimensional shapes: prism and pyramid
 - definition and properties of a prism, different types of prisms (where base area = regular polygons)
 - calculating the surface area, the volume and the mass of a prism (given the density)
 - definition and properties of a pyramid
 - calculating the surface area and the volume of a regular pyramid (base area = square)