GRADE 10 Syllabus

Computation

1. Use real numbers, R, which include the natural numbers, N, whole numbers, W, integers, Z, rational numbers, Q, and irrational numbers
2. Use prime numbers, odd numbers, even numbers, square numbers, common factors and multiples
3. Recognize the pattern in, and continue a given number sequence
4. Give approximations to specified numbers of decimal places, whole numbers and significant figures
5. Write numbers in standard form, $A \times 10^n$
6. Simplify ratios
7. Ratio and proportion
8. Calculate a given percentage of a quantity
9. Express one quantity as a percentage of another
10. Calculate percentage increase or decrease
11. Find original quantity
12. Simple Interest
13. Compound Interest

Algebraic Expressions

1. Substitution
2. Substitution
3. Simplifying algebraic expressions
4. Fractional expressions
5. Greatest common factor of algebraic terms
6. Factorization
7. Factorize by grouping
8. Simplify rational expressions

Equations

1. Two-step linear equation
2. Multi-step linear equation
3. Equations with brackets
4. Linear equations and word problems
5. Fractional Equations
6. Simultaneous Equations (both linear) and word problems
7. The product of two binomial expressions
8. Factorizing quadratic expressions with leading coefficient 1
9. Factorize quadratic expressions with leading coefficient greatest than 1.
10. Factorizing as the difference between two squares
11. Solve a quadratic equation by completing the square
12. Solving quadratic equation by factorization method
13. Solving quadratic equation by using the quadratic formula
14. Using the discriminant
15. Changing the subject of a formula

Geometry

1. Calculate unknown angles using the following geometrical properties:

   (i) sum of angles at a point
   (ii) vertically opposite angles
   (iii) adjacent angles
   (iv) corresponding angles
   (v) co-interior opposite angles
   (vi) angles of triangles and quadrilaterals
   (vii) triangle angle-sum theorem
   (viii) triangle exterior sum theorem
   (ix) angle properties of regular polygons
   (x) angle at the center of a circle
   (xi) angles in the same segment
   (xii) angle in a semi-circle
   (xiii) angles at the circumference of a circle
   (xiv) opposite angles in a cyclic quadrilateral
   (xv) relationship between the exterior and interior angle of a cyclic quadrilateral
   (xvi) angle between the tangent and radius of a circle.

2. (i) identify shapes which have rotational symmetry

   (ii) state the order of rotational symmetry of a given shape.

3. (i) state whether or not certain given figures are similar

   (ii) determine similar angles or similar sides of a triangle
   (iii) calculate the length of one side of a triangle from necessary information on a pair of similar triangle

Pythagorean's Theorem and Trigonometry

1. Use the Pythagoras' theorem to find the length of one side of a right-angled triangle when the other two sides are given
2. State the ratios for the sine, cosine and tangent of an angle
3. Use the trigonometric ratios (sine, cosine and tangent) to find the length of a side of a right-angled triangle when the length of one side and the size of one angle are given
4. Use the trigonometric ratios to find an angle in a right-angled triangle when the length of two sides are given

Linear Function

1. Identify linear functions
2. Find mid-point of a line
3. Find the length of a line
4. Determine the slope of a linear function written in slope intercept form
5. Determine the y-intercept of a linear function written in slope intercept form
6. Find the slope of a graph
7. Find the slope from two points
8. Find the equation of a line in slope intercept form
9. Find a missing coordinate using slope
10. Write an equation from a graph
11. Complete tables of values for a graph
12. Write an equation from a table
13. Write an equation from a word problem
14. Complete a table and graph a linear function
15. Equations of horizontal and vertical lines
16. Graph a horizontal or vertical line
17. Gradient of a horizontal line
18. Gradient of a vertical line
19. Equation of a line written in point-slope form
20. Parallel line
21. Perpendicular line

Two-Dimensional Figures

Polygon vocabulary

Area and Perimeter

1. Perimeter of plane shapes
2. Area of rectangles and squares
3. Area of parallelograms and triangles
4. The Hero's formula

5. Area of trapezoids
6. Area and perimeter in the coordinate plane
7. Area and circumference of circles
8. Area of compound figures
9. Area and perimeter of similar figures

Three-Dimensional Figures

1. Parts of three-dimensional figures
2. Three-dimensional figure vocabulary
3. Nets and drawings of three-dimensional figures
4. Cross-sections of three-dimensional figures

Surface area

1. Surface area of prisms
2. Surface area of pyramids
3. Surface area of sphere

Volume

1. Volume of prisms
2. Volume of pyramids

Quadratic Function

1 use a table of values to calculate a set of ordered pairs (x and y), from which a graph of y against x, or y versus x, can be drawn, using graph paper and suitable scales.

2 identify some defining characteristics of quadratic functions

3 relate linear equations to quadratic functions

4 understand how the coefficients a, b and c (from the general form $ax^2 + bx + c$) affect the shape of a parabola

5 use the formula $x = \frac{-b}{2a}$, or solve $\frac{dy}{dx} = 0$, to determine the equation for the axis of symmetry

6 calculate the coordinate for the vertex of the parabola

7 determine the roots of the parabola

8 use $\frac{dy}{dx}$ to determine the gradient of a tangent to a curve

9 draw a tangent to the curve at a point and determine the gradient to the tangent at that point.