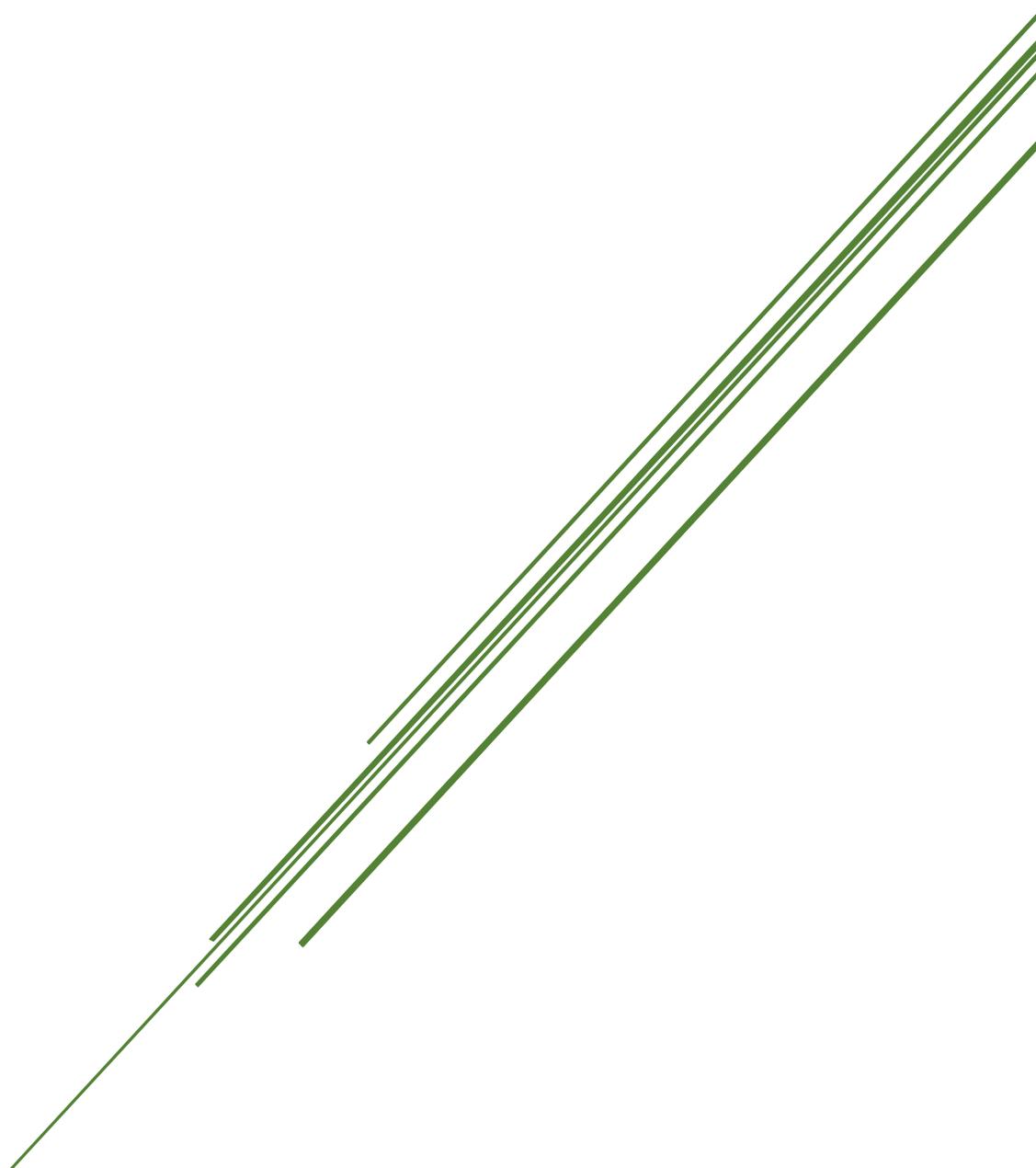


MATHEMATICS SYLLABUS

YEAR 10 Lev 2-3



Learning Outcomes Framework
September 2022

Year 10 Lev 2-3		Ref to SEC
Strand 1: Learning Area Outcome: I understand the structure of the number system and the relationship between numbers.		
Subject Focus: Number – The number system		
39	 I can convert numbers <1 in ordinary form to standard form and vice-versa.	1.3ax/ay
41	I can use assistive technology (E.g. tablets, computers and calculators) and other resources (E.g. Cuisenaire rods, Unifix cubes, base 10 blocks) appropriate to this level to calculate and to learn about numerical calculations.	1.2/3bb
42	I can work on tasks and activities including worded problems that are related to mathematical content in this strand at this level.	1.2/3bd
	I can use appropriate mathematical processes to work on tasks and/or activities that are related to mathematical content at this level and which involve one or more modes of assessment such as solving, investigating, modelling, maths trails, and research projects.	1.2/3bc

Strand 2: Learning Area Outcome: I can calculate using mental methods, pencil and paper methods, and, assistive technology methods. I can check calculations by rounding numbers and making rough approximations. I can calculate to the most appropriate level of accuracy. I can also check the reasonableness of answers.		
Subject focus: Number – Numerical calculations		
26	 I can work out mental calculations involving powers and roots, <i>E.g. $\sqrt{1600}$, 90^2, 20^3, $\sqrt[3]{8000}$.</i>	2.2q
41	I can round any decimal number to a given number of significant figures.	2.3bo
51	I can convert percentages (>100%) to fractions and vice versa	2.3an
52	I can convert percentages (>100%) to decimals and vice versa	2.3an
53	Find the percentage of a quantity where the percentage $\geq 100\%$. E.g. (i) Find 120% of 95 m. E.g. (ii) The population of a small village is 850. After one years it increased by 140%. How many new people went to live in the village during this year?	2.3am
54	I can express a quantity as a percentage of another excluding reverse percentage calculations and finding the percentage error)	2.3ao
55	I can work through simple situations involving percentage increase and decrease, (e.g. finding the discount, profit, loss and selling price)	2.3ap
58	I can use the simple interest formula.	2.2as
59	I can work out the simple interest, the principal, the rate, the time or the amount.	2.3as
67	I can work through complex situations involving personal and household finance (E.g. earnings, and VAT.)	2.3ay
74	I can use the rules for multiplying and dividing powers of numbers (integral positive, negative and zero indices) E.g. i) $7^3 \times 7^5 = 7^8$ ii) $6^5 \div 6^2 = 6^3$ iii) $(2^3)^5 = 2^{15}$ iv) $9^0 = 1$	2.2/3bh

	v) $7^8 \times 7^{-5} = 7^3$ vi) $6^5 \div 6^{-2} = 6^7$ vii) $(2^3)^5 = 2^{15}$	
76	I can use assistive technology (E.g. tablets, computers and calculators) and other resources (E.g. Cuisenaire rods, Unifix cubes, base 10 blocks) appropriate to this level to calculate and to learn about numerical calculations.	2.2/3bq
77	I can work on tasks and activities including worded problems that are related to mathematical content in this strand at this level.	2.2/3bs
	I can use appropriate mathematical processes to work on tasks and/or activities that are related to mathematical content at this level and which involve one or more modes of assessment such as solving, investigating, modelling, maths trails, and research projects.	2.2/3br

Strand 3: Learning Area Outcome: I can recognise and describe patterns and relationships in various mathematical ways and can use algebraic manipulations.

Subject Focus: Algebra – Fundamentals of Algebra

2	I can generate the terms of a sequence given the n^{th} term.	3.3e
3	I can use algebraic expressions to describe the n^{th} term of a linear sequence. E.g. $-3n - 1$	3.3f
9	I can simplify non-linear algebraic expressions by multiplying a single term over a bracket. E.g. $2x(3x + 4y) - x(x - y)$.	3.3k
14	I can evaluate non-linear expressions by substituting directed numbers.	3.3g
15	I can change the subject of the formula that includes squares and square roots and when the subject letter occurs more than once. E.g. Make r the subject of the formula $V = \pi r^2 h$, E.g. Make a the subject of the formula: $P = 2ab + 3a$	3.3u/v
18	I can represent a simple linear inequality ($<$, $>$, \leq , \geq) on a number line, E.g. represent $x \geq 9$ on a number line.	3.3ai
19	I can factorise expressions by using the common factor method.	3.3m
29	I can construct tables of values for quadratic functions.	4.3d
30	I can plot the graph of a quadratic function from a table of values.	4.3f
42	 I can identify the maximum or the minimum value from a quadratic graph.	4.3w
43	I can find the value of a coordinate given the other from a quadratic graph.	4.3x
49	I can use the rules for multiplying and dividing powers (positive, negative and zero indices) E.g. i) $a^3 \times a^5 = a^8$ ii) $y^5 \div y^2 = y^3$ iii) $(c^3)^2 = c^6$ iv) $x^0 = 1$	3.3t

	v) $x^{-1} = \frac{1}{x}$ vi) $x^{-2} = \frac{1}{x^2}$	
52	I can use assistive technology (E.g. tablets, computers and calculators) and other resources (E.g. algebra blocks) appropriate to this level to learn about the fundamentals of algebra and graphs.	3.3am
53	I can work on tasks and activities including worded problems that are related to mathematical content in this strand at this level.	3.3ao
	I can use appropriate mathematical processes to work on tasks and/or activities that are related to mathematical content at this level and which involve one or more modes of assessment such as solving, investigating, modelling, maths trails, and research projects.	3.3an

Strand 4: Learning Area Outcome: I understand and can use forms of measurement and can make reasonable estimations.		
Subject Focus: Shape, Space & Measures – Measures		
7	I can define the trigonometric ratios (sine, cosine and tangent) as the ratios of sides in a right-angled triangle.	5.3t
8	I can use the trigonometric ratios to find unknown lengths and angles in right-angled triangles.	5.3u
10	I can use trigonometric ratios in problems involving angles of elevation and depression.	5.3w
37	 I can derive and use the formula for the surface area and volume of a cylinder.	5.3ay/az/ba/ bb
39	I can find missing dimensions of 3D shapes. E.g. A cube has a volume of 1000 cm ³ . Calculate the length of the side of the cube.	5.3bf
71	 I can draw and interpret scale drawings, excluding area, involving: maps; 2D plans; angles of elevation and angles of depression; bearings.	2.2/3bd/be
54	I can use assistive technology (E.g. tablets, computers and calculators) and other resources (E.g. 2D and 3D plastic shapes, measuring instruments) appropriate to this level to learn about measures.	5.2/3bw
55	I can work on tasks and activities including worded problems that are related to mathematical content in this strand at this level.	5.2/3by
	I can use appropriate mathematical processes to work on tasks and/or activities that are related to mathematical content at this level and which involve one or more modes of assessment such as solving, investigating, modelling, maths trails, and research projects.	5.2/3bx

Strand 5: Learning Outcome: I can recognise and describe the properties of shapes. I can use these properties to construct shapes using appropriate mathematical instruments and to prove geometric statements.		
Subject focus: Shape Space and Measures – Euclidean Geometry		
10	 I can interpret and use Pythagoras' Theorem in 2D shapes.	5.3m/n
11	I can interpret and use the converse of Pythagoras' Theorem in 2D shapes.	5.3pr 5.3s

	I can deduce that a triangle whose sides are in the ratio of 3:4:5 or in the ratio of 5:12:13 is a right-angled triangle.	
16	 I can describe the properties of regular polygons related to sides, angles & diagonals, and can describe their reflective and rotational symmetry.	6.3ap
17	I can derive, calculate and use the sums of the interior and exterior angles of regular and irregular polygons.	6.3aq/ar/as/at
22	I can identify, name and draw a chord, an arc, a sector, and a segment of a circle.	6.3au
23	I can interpret and apply the circle theorems. i) The angle in a semicircle is a right angle. ii) The angle which an arc of a circle subtends at the centre is twice that which it subtends at any other point on the remaining part of the circumference iii) Angles in the same segment of a circle are equal. iv) The opposite angles of a cyclic quadrilateral are supplementary. (Angles in opposite segments are supplementary). v) The exterior angle of a cyclic quadrilateral is equal to the interior opposite angle. vi) The angle between the radius and the tangent at the point of contact is a right angle. vii) Equal chords are equidistant from the centre. viii) Chords which are equidistant from the centre of a circle are equal. ix) The perpendicular bisector of a chord passes through the centre. x) A straight line drawn from the centre of a circle to bisect a chord is at right angles to the chord. xi) If two tangents are drawn to a circle from a point outside the circle, then: (a) the tangents are equal in length; (b) the angle between the tangents is bisected by the line joining the point of intersection of the tangents to the centre; (c) the line joining the point of intersection of the tangents to the centre bisects the angle between the radii drawn to the points of contact.	6.3ax 6.3ay 6.3az 6.3ba 6.3bb 6.3bc 6.3bd 6.3be 6.3bf 6.3bg 6.3bh
26	I can construct regular polygons using ruler, protractor and compasses.	7.3m
34	I can use assistive technology (E.g. tablets and computers, including dynamic geometry software packages and LOGO) and other resources (E.g. 2D and 3D plastic shapes) appropriate to this level to learn about properties of shapes.	6.3bv
35	I can work on tasks and activities including worded problems that are related to mathematical content in this strand at this level.	6.3bx
	I can use appropriate mathematical processes to work on tasks and/or activities that are related to mathematical content at this level and which involve one or more modes of assessment such as solving, investigating, modelling, maths trails, and research projects.	6.3bw

Strand 6: Learning Area Outcome: I can describe position and movement of shapes in a plane.

Subject Focus: Shape, Space & Measures – Transformation Geometry

14	 I can draw and describe rotations of a simple shape about any vertex of the shape and the origin using angles of 90° and 180° .	8.2k
15	 I can deduce that rotations preserve length and angle.	8.3l
21	I can use assistive technology (E.g. tablets and computers) and other resources (E.g. 2D and 3D plastic shapes) appropriate to this level to learn about transformation geometry.	8.2/3w
22	I can work on tasks and activities including worded problems that are related to mathematical content in this strand at this level.	8.2/3y
	I can use appropriate mathematical processes to work on tasks and/or activities that are related to mathematical content at this level and which involve one or more modes of assessment such as solving, investigating, modelling, maths trails, and research projects.	8.2/3x

Strand 7: Learning Area Outcome: I can collect, analyse, interpret and communicate statistical information.		
Subject Focus: Data Handling & Chance – Statistics		
4	I can interpret data from stacked and clustered bar charts.	9.3j
5	   I can construct stacked and clustered bar charts.	9.3k
14	I can find the mean of a set of ungrouped data from a frequency table.	9.2z
16	I can find the median of a set of ungrouped data from a frequency table.	9.2ae
17	I can find the mode of a set of ungrouped data from a frequency table.	9.2ag
18	I can find the range of a set of ungrouped data from a frequency table.	9.2ah
23	I can use assistive technology (E.g. tablets, computers and calculators) and other learning resources to learn about statistics.	9.2/3an
24	I can work on tasks and activities including worded problems that are related to mathematical content in this strand at this level.	9.2/3ap
	I can use appropriate mathematical processes to work on tasks and/or activities that are related to mathematical content at this level and which involve one or more modes of assessment such as solving, investigating, modelling, maths trails, and research projects.	9.2/3ao

Strand 8: Learning Area Outcome: I understand ideas of chance and uncertainty.		
Subject Focus: Data Handling & Chance – Probability		
4	I can work out the probability of an event from a frequency table.	10.3d
9	I can work out the probability of mutually exclusive events.	10.3j
10	I can construct a possibility space of two events and use it to work out the probability of an outcome.	10.2l

14	I can use assistive technology (E.g. tablets, computers and calculators) and other learning resources to learn about probability	10.3q
15	I can work on tasks and activities including worded problems that are related to mathematical content in this strand at this level.	10.3r
	I can use appropriate mathematical processes to work on tasks and/or activities that are related to mathematical content at this level and which involve one or more modes of assessment such as solving, investigating, modelling, maths trails, and research projects.	10.3s