

# Department of Mathematics

## Scheme of Work

### Form 2 Term 12017 - 2018

WEEK	Lesson Number	Specific Objectives/Teaching Points	Teaching Methods /Resources
Week 1 ending 8 <sup>th</sup> Sept	1	<b>Number Sets</b> <ul style="list-style-type: none"> <li>• Natural numbers (N), Whole numbers (W), Integers (<math>Z, Z^-, Z^+</math>) &amp; Real Numbers (<math>R</math>)</li> <li>• Associative Law - Addition &amp; Multiplication  <math>a + (b + c) = (a + b) + c</math>  <math>a \times (b \times c) = (a \times b) \times c</math></li> <li>• Comutative Law - Addition &amp; Multiplication  <math>a + b = b + a</math>  <math>a \times b = b \times a</math></li> <li>• Distributive Law</li> <li>• <math>a(x \pm y) = ax \pm ay</math>  <math>14 \times 26 = 14(20 + 6) = 14 \times 20 + 14 \times 6</math>  <math>14 \times 26 = 14(30 - 4) = 14 \times 30 - 14 \times 4</math></li> <li>• Identity and Inverse elements for both Addition and Multiplication</li> </ul>	White board Multimedia 'Math is Fun Website' Group work
	2	<b>Directed Numbers</b> <ul style="list-style-type: none"> <li>• Addition, Subtraction, Multiplication and Division</li> <li>• Evaluation of simple expressions involving <math>a^n</math> where <math>a \in R</math> and <math>n \in Z</math> (See Laws of Indices)</li> </ul>	
	3	<b>Laws of Indices</b> <ul style="list-style-type: none"> <li>• <math>a^n \times a^m = a^{(n+m)}</math></li> <li>• <math>a^n \div a^m = a^{(n-m)}</math></li> <li>• <math>a^0 = 1, a \neq 0</math></li> </ul> Practice questions	
	4	<b>Laws of Indices</b> <ul style="list-style-type: none"> <li>• <math>a^{-n} = \frac{1}{a^n} = \left(\frac{1}{a}\right)^n, a \neq 0</math></li> </ul> Also, $a^{-n} \times a^n = 1$ and $\frac{1}{a^{-n}} = a^n$ <ul style="list-style-type: none"> <li>• <math>(a^n)^m = a^{nm} = (a^m)^n</math></li> <li>• <math>(abc)^n = a^n b^n c^n</math></li> <li>• Practice questions</li> </ul>	
	5	<b>Priority of Operations</b> <ul style="list-style-type: none"> <li>• BODMAS/PEMDAS</li> </ul>	

Week 2 ending 15 <sup>th</sup> Sept	6	<b>Number</b> <ul style="list-style-type: none"> <li>• Conversion from fractions to decimal form.</li> <li>• Decimal places</li> <li>• Significant figures</li> </ul>	White board Multimedia 'Math is Fun Website' Group work  Formative assessment - Paper & pen/pencil test
	7	<b>Number</b> <ul style="list-style-type: none"> <li>• Standard form</li> <li>• Computation ( <math>-</math>, <math>+</math>, <math>\times</math>, <math>\div</math> ) involving numbers expressed in standard form</li> <li>• Expression of answers to specified degrees of accuracy (dec. pl. &amp; sig. fig).</li> </ul>	
	8	<b>Priority of Operations</b> <ul style="list-style-type: none"> <li>• Review questions on lessons 1 - 7</li> </ul>	
	9	<ul style="list-style-type: none"> <li>• <b>Coursework Examination</b> on lessons 1 - 7</li> </ul>	
	10	<b>Geometry</b> <ul style="list-style-type: none"> <li>• Angles on a straight line</li> <li>• Angles at a point</li> <li>• Right angles</li> <li>• Angles of a triangle Scalene, Isosceles, Equilateral,</li> <li>• Exterior angles of a triangle</li> </ul> Practice Questions	
Week 3 ending 22 <sup>nd</sup> Sept	11	<b>Geometry</b> <ul style="list-style-type: none"> <li>• Parallel lines &amp; Transversals</li> <li>• Corresponding angles</li> <li>• Alternate angles</li> </ul> Worksheet	White board Multimedia 'Math is Fun Website' Group work  Teacher Illustration  Student Investigations
	12	<b>Geometry</b> <ul style="list-style-type: none"> <li>• Vertically Opposite angles</li> <li>• Co-interior angles</li> </ul> Worksheet	
	13	<b>Geometry</b> <ul style="list-style-type: none"> <li>• Introduction to the use of geometrical instruments.</li> <li>• Construction lines and arcs: Solid, broken, light &amp; heavy</li> <li>• Review questions: Construction triangles with three known sides.</li> </ul>	
	14	<b>Geometry</b>	

		<ul style="list-style-type: none"> <li>• Construction of each of the following angles on a light and solid baseline: 30°, 45°, 60°, 90°, 120°, 150°</li> <li>• Bisection of each of the angles listed above.</li> </ul>	
	15	<b>Geometry</b> <ul style="list-style-type: none"> <li>• Bisection of a line segment.</li> <li>• Erection of a perpendicular at a point on a line.</li> <li>• Drop a perpendicular from a point to a line.</li> </ul>	
Week 4 ending 29 <sup>th</sup> Sept	16	<b>Geometry</b> <ul style="list-style-type: none"> <li>• Construction of triangles, given <ul style="list-style-type: none"> <li>▪ One side and two angles</li> <li>▪ Two sides and an included angle</li> <li>▪ Three sides</li> </ul> </li> </ul>	White board Multimedia 'Math is Fun Website' Group work
Republic Day Holiday 25 <sup>th</sup> Sept	17	<b>Geometry</b> <ul style="list-style-type: none"> <li>• Properties of a rhombus.</li> <li>• Construction of a rhombus.</li> <li>• Properties of a kite.</li> <li>• Construction of a kite.</li> </ul>	Teacher Illustration  Student Investigations
	18	<b>Geometry</b> <ul style="list-style-type: none"> <li>• Construction of a <i>circumcircle</i> of a triangle. Ex. 4e #8</li> <li>• Construction of an <i>incircle</i> of a triangle. Ex. 4e #11</li> </ul>	Formative assessment – Oral presentation and craft skills
	19	<b>Geometry</b> <ul style="list-style-type: none"> <li>• <b>Group Coursework Assignment.</b> In groups of five, students are required to use plain paper to create models of one of the solid shapes listed below: <i>Cube,</i> <i>Tetrahedron,</i> <i>Octahedron,</i> <i>Square-based pyramid,</i> <i>Prism with triangular cross-section,</i> <i>Eight-pointed star.</i> (Ex. 4f)</li> <li>• Groups make oral presentation of the properties of their respective shapes to the class, using charts.</li> </ul>	
	20	<b>Geometry</b> <ul style="list-style-type: none"> <li>• Review questions on lessons 10 -19</li> </ul>	

Week 5 ending 6 <sup>th</sup> Oct	21	<b>Geometry</b> <ul style="list-style-type: none"> <li>• Scaled drawings (calculations)</li> <li>• Scaled drawings of real-life plane shapes</li> <li>• Map Ratio</li> </ul>	White board Multimedia 'Math is Fun Website' Group work
	22	<b>Geometry</b> <ul style="list-style-type: none"> <li>• Angles of elevation</li> <li>• Angles of depression</li> <li>• Embodiment of real-life problems in mathematical form, using simple sketches (triangles). e.g. Ladder leaning against a vertical wall or Top of vertical flagpole from a point on level ground, etc.</li> </ul>	Teacher Illustration  Student Investigations  Formative assessment –
	23	<b>Geometry</b> <ul style="list-style-type: none"> <li>• Use scaled drawings to construct models of real-life problems involving angles of elevation and depression.</li> <li>• Construction of scaled drawings to determine unknown distances or angles from real-life scenarios. (Simple triangles).</li> </ul>	Inspection and marking of exercise books
	24	<b>Geometry</b> <ul style="list-style-type: none"> <li>• Practice questions involving angles of elevation and depression.</li> </ul>	
	25	<b>Geometry</b> <ul style="list-style-type: none"> <li>• Three figure bearings.</li> <li>• North-south lines and East west lines</li> <li>• Position of point A from point B specifying distance and direction (using three figure bearings)</li> </ul>	
School Bazaar Saturday 7 <sup>th</sup> Oct.			
Week 6 ending 13 <sup>th</sup> Oct	26	<b>Geometry</b> <ul style="list-style-type: none"> <li>• Determine related angles in diagrams involving three figure bearings</li> </ul>	White board Multimedia 'Math is Fun Website' Group work
	27	<b>Geometry</b> <ul style="list-style-type: none"> <li>• Use scaled drawings to construct models of real-life problems involving three figure bearings.</li> <li>• Construction of scaled drawings to determine unknown distances or angles from real-life scenarios involving three figure bearings.</li> <li>• (Simple right angled triangles).</li> </ul>	Teacher Illustration  Student Investigations

	28	<b>Geometry</b> <ul style="list-style-type: none"> <li>Practice questions involving three figure bearings in real-life scenarios.</li> <li>Related scaled drawings.</li> </ul>	Formative assessment – Marking of Exercise Books
	29	<b>Geometry</b> <ul style="list-style-type: none"> <li>Practice questions involving three figure bearings in real-life scenarios.</li> <li>Related scaled drawings.</li> </ul>	Paper & pen/pencil test
	30	<b>Geometry</b> <ul style="list-style-type: none"> <li>COURSEWORK EXAMINATION</li> </ul>	
Week 7 ending 20 <sup>th</sup> Oct  Divali Holiday 19 <sup>th</sup> Oct	31	<b>Algebra</b> <ul style="list-style-type: none"> <li>Review of Number Laws               <ul style="list-style-type: none"> <li>Associative law</li> <li>Commutative law</li> <li>Distributive law</li> </ul> </li> <li>Introduction to simple algebraic sums and products.                e.g. (i) <math>2(5x) + 3(4x) =</math>,                (ii) <math>\frac{x}{2} + \frac{x}{5} =</math>                (iii) <math>7(2x - 3) =</math></li> </ul>	White board Multimedia 'Math is Fun Website' Group work  Teacher Illustration  Student Investigations
	32	<b>Algebra</b> <ul style="list-style-type: none"> <li>Use of the Number laws to simplify algebraic <b>expressions</b>.  <math>2(5x + 4) =</math>  <math>6(3x - 8) =</math>  <math>2(5x + 4) + 15x =</math>  <math>2(14 - 8x) - 17 =</math></li> </ul>	Formative assessment – Marking of Exercise Books
	33	<b>Algebra</b> <ul style="list-style-type: none"> <li>Review of solution of simple algebraic <b>equations</b>.  <math>8 - x = 4 + 3x</math></li> <li>More algebraic equations  <math>2(5x + 4) = 28</math>  <math>3(7x - 4) = 4(2x + 5) + 7</math></li> </ul>	
	34	<b>Algebra</b> <ul style="list-style-type: none"> <li>Practice – Solving equations</li> </ul>	
	35	<b>Algebra</b> <ul style="list-style-type: none"> <li>Practice – Solving equations</li> </ul>	
Week 8 ending	36	<b>Algebra</b> <ul style="list-style-type: none"> <li>Multiplication of algebraic fractions</li> </ul>	White board Multimedia

27 <sup>th</sup> Oct		$20\left(\frac{3x}{4}\right) =$ <ul style="list-style-type: none"> <li>• Division of algebraic fractions</li> </ul> $\frac{9x}{16} \div \frac{3x}{2} =$	'Math is Fun Website' Group work  Teacher Illustration  Student Investigations  Formative assessment – Marking of Exercise Books
	37	<b>Algebra</b> <ul style="list-style-type: none"> <li>• Solving equations involving simple algebraic fractions.</li> </ul> $20\left(\frac{3x}{4}\right) = 25$	
	38	<b>Algebra</b> <ul style="list-style-type: none"> <li>• Practice in solving equations involving simple algebraic fractions.</li> </ul> $\frac{3x}{8} = \frac{5}{12}$	
	39	<b>Algebra</b> <ul style="list-style-type: none"> <li>• Solving equations involving more algebraic fractions.</li> <li>• <math>\frac{x}{4} + \frac{3}{8} = \frac{2}{5} - \frac{5x}{12}</math></li> </ul>	
	40	<b>Algebra</b> <ul style="list-style-type: none"> <li>• Practice solving equations involving more algebraic fractions.</li> </ul> $\frac{3x}{4} - \frac{3}{8} = \frac{x}{5} - \frac{1}{12} + \frac{1}{2}$	
Week 9 ending 3 <sup>rd</sup> Nov	41	<b>Algebra</b> <ul style="list-style-type: none"> <li>• Write given worded statements in algebraic form.</li> </ul> <p><i>The length of a rectangle is one cm less than twice its width. If the width is x cm, write an expression in terms of x for its length.</i></p>	White board Multimedia 'Math is Fun Website' Group work  Teacher Illustration  Student Investigations  Formative assessment – Marking of Exercise Books
	42	<b>Algebra</b> <ul style="list-style-type: none"> <li>• Write given worded statements in algebraic form.</li> <li>• Use algebraic expressions to solve worded problems.</li> </ul>	
	43	<b>Algebra</b> <ul style="list-style-type: none"> <li>• Use algebraic expressions to solve worded problems. (More practice)</li> </ul>	
	44	<b>Algebra</b> <ul style="list-style-type: none"> <li>• Create simple formulae from given information.</li> </ul> <p><i>The perimeter of a square is P cm. If the length of one side of the square is x cm, express P in terms of x.</i></p>	
	45	<b>Algebra</b>	

		<ul style="list-style-type: none"> <li>• Create simple formulae from given information. (More practice) <i>A stack of paper containing T sheets is shared among n students so that each person gets m sheets. If there were r sheets remaining, construct a formula involving T, n, m and r.</i></li> </ul>	
Week 10 Ending 10 <sup>th</sup> Nov	46	<b>Algebra</b> <ul style="list-style-type: none"> <li>• Substitution of numerical values into formulae. If <math>p = \frac{q+r}{2t}</math>, where <math>q = -2</math>, <math>r = 18</math>, <math>t = 4</math>, find the value of <math>p</math>.</li> </ul>	White board Multimedia 'Math is Fun Website' Group work  Teacher Illustration  Student Investigations  Formative assessment –
	47	<b>Algebra</b> <ul style="list-style-type: none"> <li>• Substitution of numerical values into formulae. (simple numerical fractions)</li> </ul>	
	48	<b>Algebra</b> <ul style="list-style-type: none"> <li>• Changing the subject of simple formulae.</li> <li>• <math>p = 2t</math></li> <li>• <math>k = 3x + 5</math></li> <li>• <math>r + 2 = \frac{4x}{z}</math></li> <li>• <math>\frac{5y}{3} = \frac{4x}{z}</math></li> </ul>	
	49	<b>Algebra</b> <ul style="list-style-type: none"> <li>• Changing the subject of simple formulae.</li> <li>• <math>p = 2t + 5</math></li> <li>• <math>k - 3 = 3x + 5</math></li> <li>• <math>2(r + 2) = 6x - 1</math></li> <li>• <math>\frac{5+y}{3} = 2r</math></li> </ul>	
	50	<b>Algebra</b> <ul style="list-style-type: none"> <li>• Changing the subject of simple formulae.</li> <li>• <math>p = \sqrt{2t}</math></li> <li>• <math>k = x^2 + 5</math></li> <li>• <math>4(x - 2) = x - 5</math></li> <li>• <math>y = \frac{4 - 2x}{z}</math></li> </ul>	
Week 11 Ending 17 <sup>th</sup> Nov	51	<b>Algebra</b> <ul style="list-style-type: none"> <li>• Review worksheet on Algebra</li> </ul>	White board Multimedia 'Math is Fun Website' Group work
	52	<b>Algebra</b> <ul style="list-style-type: none"> <li>• Review worksheet on Algebra</li> </ul>	
	53	<b>Algebra</b>	

		<b>Coursework Examination on Algebra</b>	
	54	<b>Probability</b> <ul style="list-style-type: none"> <li>Terms used in probability theory Random Bias Experiment Outcome Event Possibility Space/Sample Space diagrams</li> <li>Probability formula (theoretical) <math display="block">P(A) = \frac{\text{Number of favourable outcomes}}{\text{Total number of possible outcomes}}</math></li> </ul>	Teacher Illustration  Student Investigations  Formative assessment – Paper & pen/pencil test
	55	<b>Probability</b> <ul style="list-style-type: none"> <li>Events as one or more outcomes.</li> <li>Using the Possibility Space diagram to determine probability of events.</li> </ul>	
Week 12 Ending 24 <sup>th</sup> Nov	56	<b>Probability</b> <ul style="list-style-type: none"> <li>Mutually Exclusive Events</li> <li>Addition of probabilities</li> </ul>	
	57	<b>Probability</b> <ul style="list-style-type: none"> <li>Independent Events</li> <li>Multiplication of probabilities</li> </ul>	
	58	<b>Probability</b> <ul style="list-style-type: none"> <li>Probability trees</li> </ul>	
	59	<b>Probability</b> <ul style="list-style-type: none"> <li>Experimental probability</li> </ul>	
	60	<b>Revision Day</b>	
Week 13 Ending 1st Dec	END OF TERM EXAMINATIONS		
Week 14 Ending 8th Dec	END OF TERM EXAMINATIONS		Summative Assessment Paper & pen/pencil test.
Week 15 Ending 15th Dec		Preparation of Reports	Evaluation of Performance
		Preparation of Reports	
		Preparation of Reports	
		Christmas Concert and Distribution of Reports	
		End of Term	