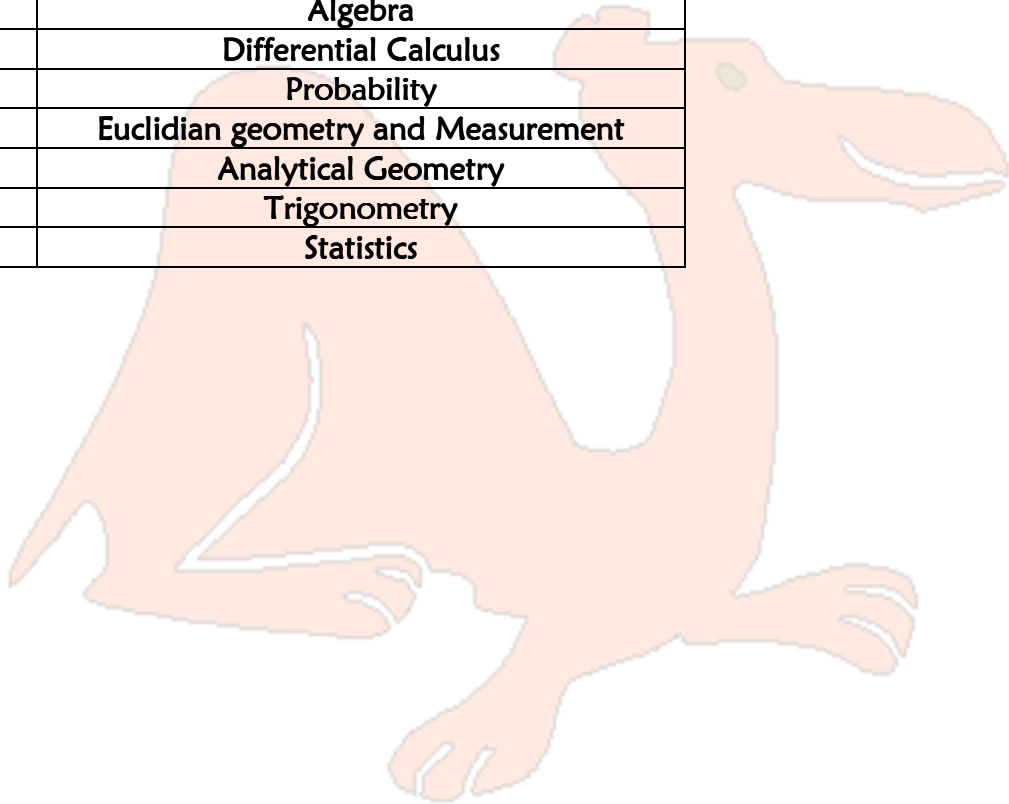




# CAMI Education linked to CAPS: Mathematics Grade 10

The main topics in the FET Mathematics Curriculum

NUMBER	TOPIC
1	Functions
2	Number patterns, sequences and series
3	Finance, growth and decay
4	Algebra
5	Differential Calculus
6	Probability
7	Euclidian geometry and Measurement
8	Analytical Geometry
9	Trigonometry
10	Statistics





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GRADE 10_Term 1		
TOPIC	CONTENT	CAMI KEYS
10.4 Algebraic expressions	1. Understand that real numbers can be rational and irrational.	1.8.6.1 to 1.8.6.3 2.3.8.1
	2. Establish between which two integers a given simple surd lies.	4.3.5.7
	3. Round real numbers to an appropriate degree of accuracy.	2.3.3.4 2.3.3.5 2.3.8.1 2.3.8.2 2.3.8.3
	4. Multiplication of a binomial by a trinomial.	4.4.7.1 4.4.7.2 4.4.7.3 4.4.7.4 4.4.8 4.4.9.1 4.4.9.2
	5. Factorization to include types taught in grade 9 and: <ul style="list-style-type: none"><li>• Trinomials</li></ul>	4.5.4.1 4.5.4.2 4.5.4.3 4.5.5.1 4.5.5.2 4.5.5.3 4.5.5.4 4.5.5.5
	<ul style="list-style-type: none"><li>• Grouping in pairs</li></ul>	4.5.2.1 4.5.2.2 4.5.2.3 4.5.6.1 4.5.6.2
	<ul style="list-style-type: none"><li>• Sum and difference of two cubes</li></ul>	4.5.3.4 4.5.3.5



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	6. Simplification of algebraic fractions using factorization with denominators of cubes (limited to sum and difference of cubes).	4.5.7.1 4.5.7.2 4.5.8 4.7.4.1 4.7.4.2 4.7.4.3 4.7.5.1 4.7.5.2 4.7.6.1 4.7.6.2 4.7.6.3 4.7.6.4 4.7.6.5 4.7.7.1 4.7.7.2 4.7.7.3 4.8.2.3 4.8.5.1 4.8.5.2 4.8.5.3 4.8.5.4 4.8.6.1 4.8.6.1 4.8.6.2 4.8.6.3 4.8.7.1 4.8.7.2 4.8.7.3
<b>10.4 Exponents</b>	1. Revise laws of exponents learnt in Grade 9 where $x, y > 0$ and $m, n \in \mathbb{Z}$ : <ul style="list-style-type: none"><li>• <math>x^m \times x^n = x^{m+n}</math></li><li>• <math>x^m \div x^n = x^{m-n}</math></li><li>• <math>x^m \times y^m = (xy)^m</math></li><li>• <math>(x^m)^n = x^{mn}</math></li></ul> Also by definition: <ul style="list-style-type: none"><li>• <math>x^{-1} = \frac{1}{x}; x \neq 0</math></li><li>• <math>x^0 = 1; x \neq 0</math></li><li>•</li></ul> 2. Use the laws of exponents to simplify	4.3.2.1 4.3.2.2 4.3.2.3 4.3.3.1 4.3.3.2 4.3.3.3 4.3.3.4 4.3.3.5 4.3.3.6 4.3.4.1 4.3.4.2



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	expressions and solve equations, accepting that the rules also hold for $m, n \in Q$ .	4.3.4.3 4.3.5.7 4.9.1.1 4.9.1.2 4.9.1.3 4.9.1.4 4.9.2.1 4.9.2.2 4.9.2.3 4.9.3
<b>10.2 Numbers and patterns</b>	<b>Patterns</b> Investigate number patterns leading to those where there is a constant difference between consecutive terms, and the general term (without using a formula –see content overview) is therefore linear.	4.1.5.1 4.1.5.2 4.1.7.1
<b>10.4 Equations and Inequalities</b>	1. Revise the solution of linear equations.  2. Solve quadratic equations (by factorization).  3. Solve simultaneous linear equations in two unknowns.	4.2.1.4 4.2.1.5 4.2.1.6 4.2.1.7 4.2.1.8 4.2.1.9 4.2.2.1 4.2.2.2 4.2.2.3 4.2.3.1 4.2.3.2 4.2.3.3 4.2.3.4 4.2.3.5 4.2.3.6 4.2.3.7 4.2.3.9 4.2.3.10 4.2.3.8  4.2.5.5 4.2.5.6  4.6.1.1



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	<p>4. Solve word problems involving linear, quadratic or simultaneous linear equations.</p> <p>5. Solve literal equations (changing the subject of a formula).</p> <p>6. Solve linear inequalities (and show solution graphically). Interval notation must be known.</p>	<p>4.6.1.2 4.6.1.3 4.6.2.1 4.6.2.2 4.6.2.5 6.8.1 6.8.2.1 5.3.1.1 5.3.1.2 5.3.1.3 5.3.1.4 1.8.7.3 4.2.4.1 4.2.4.2 4.2.4.3</p>
<b>10.9 Trigonometry</b>	<p>1. Define the trigonometric ratios <math>\sin \theta</math>, <math>\cos \theta</math> and <math>\tan \theta</math> using right-angled triangles.</p> <p>2. Extend the definitions of <math>\sin \theta</math>, <math>\cos \theta</math> and <math>\tan \theta</math> for <math>0^\circ \leq \theta \leq 360^\circ</math>.</p> <p>3. Define the reciprocals of the trigonometric ratios <math>\operatorname{cosec} \theta</math>, <math>\sec \theta</math> and <math>\cot \theta</math>, using right-angled triangles (these three reciprocals should be examined in grade 10 only).</p> <p>4. Derive values of the trigonometric ratios for the special cases (without using a calculator): <math>\{0^\circ; 30^\circ; 45^\circ; 60^\circ; 90^\circ\}</math></p> <p>5. Solve two-dimensional problems involving right-angled triangles.</p> <p>6. Solve simple trigonometric equations for</p>	<p>7.2.1.1 7.2.1.3 7.2.1.5 7.2.2.1 7.2.3  7.2.1.2  7.3.1.1 7.3.2.1  7.7.1.1 7.7.1.2 7.7.1.3 7.7.1.4 7.7.1.5 7.7.1.6 7.7.5.1</p>



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	angles between $0^\circ$ and $90^\circ$ .	7.6.1.1 7.6.1.3 7.6.2.1 7.6.3.1 7.6.3.3 7.6.3.5 7.6.4.1
	7. Use diagrams to determine the numerical values of ratios for angles from $0^\circ$ and $360^\circ$ .	7.6.5.1
<b>GRADE 10 Term 2</b>		
<b>10.1 Functions</b>	<p>1. The concept of a function, where a certain quantity (output value) uniquely depends on another quantity (input value). Work with relationships between variables using tables, graphs, words and formulae. Convert flexibly between these representations.</p> <p>NOTE: that the graph defined by <math>y = x</math> should be known from Grade 9.</p> <p>2. Point by point plotting of basic graphs defined by <math>y = x^2</math>, <math>y = \frac{1}{x}</math> and <math>y = b^x</math>; <math>b &gt; 0</math> and <math>b \neq 1</math> to discover shape, domain(input values), range (output values), asymptotes, axes of symmetry, turning points and intercepts on the axes (where applicable).</p> <p>3. Investigate the effect of <math>a</math> and <math>q</math> on the graphs defined by <math>y = a.f(x) + q</math> where</p>	<p>4.6.7.1 4.6.7.2 4.6.7.3 6.1.3 6.1.4 6.1.5 6.1.6 6.2.1 6.2.2 6.2.3 6.2.4 6.2.5 6.2.6 6.2.8.1 6.2.8.2 6.3.1.1 6.3.1.2 6.3.2 6.3.3 6.3.4 6.4.1.1 6.4.2 6.5.5.1 6.5.5.2 6.7.1 6.7.2 6.7.3 6.7.4 6.4.1.2 6.4.3</p>



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	<p><math>f(x) = x, f(x) = x^2, f(x) = \frac{1}{x}</math> and <math>f(x) = b^x, b &gt; 0, b \neq 1.</math></p> <p>4. Point by point plotting of basic graphs defined by: <math>y = \sin \theta, y = \cos \theta</math> and <math>y = \tan \theta</math> for <math>\theta \in [0^\circ; 360^\circ]</math>.</p> <p>5. Study the effect of <math>a</math> and <math>q</math> on the graphs defined by: <math>y = a \sin \theta + q, y = a \cos \theta + q</math> and <math>y = a \tan \theta + q</math> where <math>a, q \in Q</math> for <math>\theta \in [0^\circ; 360^\circ]</math>.</p> <p>6. Sketch graphs, find the equations of given graphs and interpret graphs.</p> <p>NOTE: Sketching of the graphs must be based on the observation of number 3 and 5.</p>	<p>6.4.4 6.5.5.3 6.5.5.4 6.5.5.5 6.7.3</p> <p>7.8.2.1 7.8.2.2 7.8.2.7</p> <p>6.2.7 6.6.1 6.6.3</p>
<b>10.7 Euclidean Geometry</b>	<p>1. Revise basic results established in earlier grades regarding lines, angles and triangles, especially the similarity and congruence of triangles.</p> <p>2. Investigate line segments joining the midpoints of two sides of a triangle.</p> <p>3. Define the following special quadrilaterals:</p> <ul style="list-style-type: none"> <li>• kite</li> <li>• parallelogram</li> <li>• rectangle</li> <li>• rhombus</li> <li>• square</li> <li>• trapezium.</li> </ul> <p>Investigate and make conjectures about the</p>	<p>Revision see grade 9</p> <p>8.3.8</p> <p>8.4.2.1 8.4.4.1 8.4.4.2 8.4.5.1 8.4.5.2 8.4.6 8.4.7</p>



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	properties of the sides, angles, diagonals and areas of these quadrilaterals. Prove these conjectures.	
<b>GRADE 10 Term 3</b>		
<b>10.8 Analytical Geometry</b>	<p>Represent geometric figures on a Cartesian coordinate system.</p> <p>Derive and apply for any two points <math>(x_1; y_1)</math> and <math>(x_2; y_2)</math> the formulae for calculating:</p> <ul style="list-style-type: none"> <li>• Distance between the two points;</li>   <li>• Gradient of the line segment connecting the two points (and from that identify parallel and perpendicular lines);</li>   <li>• Coordinates of the mid-point of the line segment joining the two points.</li> </ul>	<p><b>8.8.7</b></p> <p><b>8.8.1.1</b> <b>8.8.1.2</b> <b>8.8.1.3</b></p> <p><b>8.8.3.1</b> <b>8.8.3.2</b> <b>8.8.3.3</b> <b>8.8.4.1</b> <b>8.8.4.2</b> <b>6.3.5</b> <b>6.3.6</b></p> <p><b>8.8.2.1</b> <b>8.8.2.2</b> <b>8.8.2.3</b></p>
<b>10.3 Finance and growth</b>	<p>Use the simple and compound growth formulae <math>A = P(1+in)</math> and <math>A = P(1+i)^n</math> to solve problems, including:</p> <ul style="list-style-type: none"> <li>• annual interest</li> <li>• hire purchase</li> <li>• inflation</li> <li>• population growth and other real life problems.</li> </ul> <p>Understand the implication of fluctuating foreign exchange rates (e.g. on the petrol price, imports, exports, overseas travel).</p>	<p><b>10.6.2.6</b> <b>10.6.2.1</b> <b>10.6.6.1</b> <b>10.6.6.2</b> <b>10.6.6.4</b> <b>10.6.6.5</b> <b>10.7.1.3</b> <b>10.7.1.4</b> <b>10.7.1.5</b> <b>10.7.2.5</b> <b>10.7.4.2</b></p>
<b>10.10 Statistics</b>	1. Revise measures of central tendency in ungrouped data.	<p><b>10.3.4.3</b> <b>10.3.4.4</b></p>





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	<p>2. Measures of central tendency in grouped data:</p> <ul style="list-style-type: none"><li>• Calculation of mean estimate of grouped and ungrouped data and identification of modal interval and interval in which the median lies.</li></ul> <p>3. Revision of range as a measure of dispersion and extension to include percentiles, quartiles, interquartile and semi interquartile range.</p> <p>4. Five number summary (maximum, minimum and quartiles) and box and whisker diagram.</p> <p>5. Use the statistical summaries (measures of central tendency and dispersion). And graphs to analyze and make meaningful comments on the context associated with the given data.</p>	<p><b>10.3.4.1</b> <b>10.3.4.2</b></p> <p><b>10.5.1</b> <b>10.5.2</b> <b>10.5.3</b> <b>10.5.4</b></p>
<p><b>10.9</b> <b>Trigonometry</b></p>	<p>Problems in two dimensions.</p>	<p><b>7.7.1.1</b> <b>7.7.1.2</b> <b>7.7.1.3</b> <b>7.7.1.4</b> <b>7.7.1.5</b> <b>7.7.1.6</b></p>
<p><b>10.7</b> <b>Euclidean</b> <b>Geometry</b></p>	<p>Solve problems and prove riders using the properties of parallel lines, triangles and quadrilaterals.</p>	<p><b>8.4.2.1</b> <b>8.4.4.2</b></p>
<p><b>10.7</b> <b>Measurement</b></p>	<p>1. Revise the volume and surface areas of right-prisms and cylinders.</p> <p>2. Study the effect on volume and surface area when multiplying any dimension by a constant factor <math>k</math>.</p> <p>3. Calculate the volume and surface areas of spheres, right pyramids and right cones.</p>	<p><b>9.3.3.8</b> <b>9.3.3.5</b> <b>9.3.3.6</b> <b>9.3.3.7</b> <b>9.3.6.6</b> <b>9.3.6.4</b> <b>9.3.6.5</b> <b>9.4.1</b> <b>9.4.2</b> <b>9.4.3</b></p>



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		9.4.4 9.4.5 9.5.2.3 9.5.2.4 9.5.3.1 9.5.3.2 9.5.3.3 9.5.3.4 9.5.4.1 9.5.3.5 9.5.5.1
<b>GRADE 10_Term 4</b>		
<b>10.6 Probability</b>	<p>1. The use of probability models to compare the relative frequency of events with the theoretical probability.</p> <p>2. The use of Venn-diagrams to solve probability problems, deriving and applying the following for any two events A and B in a sample space S: <math>P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)</math> A and B are mutually exclusive if <math>P(A \text{ and } B) = 0</math>; A and B are complementary if they are mutually exclusive; and <math>P(A) + P(B) = 1</math>. Then <math>P(B) = P(\text{not } A) = 1 - P(A)</math>.</p>	10.1.6 10.2.6.1  10.2.8 10.2.9 10.3.3.1 10.3.3.2
<b>Revision</b>		