CAMI Education linked to CAPS: Mathematics Grade 12

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

P.O.Box 1260 Cresta 2118 www.camiweb.com
Tel (011)476 2020 Fax(011)476 6824

CAMI Education linked to CAPS: Mathematics Grade 12

GRADE 12_Term 1		
TOPIC	**CONTENT**	**CAMI KEYS**
12.2 Patterns, sequences, series	1. Number patterns, including arithmetic and geometric sequences and series. 2. Sigma notation 3. Derivation and application of the formulae for the sum of arithmetic and geometric series: • $S_n = \frac{n}{2}(2a+(n-1)d)$ • $S_n = \frac{n}{2}(a+l)$ • $S_n = \frac{a(r^n-1)}{r-1}; r \neq 1$ • $S_\infty = \frac{a}{r-1}; -1 < r < 1; r \neq 1$	**4.1.6.1** **4.1.6.2** **4.1.6.3** **4.1.6.4** **4.1.6.5** **4.1.6.6** **4.1.6.7** **4.1.6.8** **4.1.6.9** **4.1.7.2** **4.1.7.3** **4.1.7.4** **4.1.7.5** **4.1.7.6** **4.1.7.7**
12.1 Functions	1. Definition of a function. 2. General concept of the inverse of a function and how the domain of the function may need to be restricted (in order to obtain a one-on-one function) to ensure that the inverse is a function. 3. Determine and sketch graphs of the inverses of the functions defined by: • $y = ax+q; y = ax^2$ • $y = b^x; b > 0; b \neq 1$ Focus on the following characteristics: Domain and range, intercepts with the axes, turning points, minima, maxima, asymptotes (horizontal and vertical), shape and	**5.6.2.1** **5.6.2.2** **5.6.2.3** **6.7.5**

CAMI Education linked to CAPS: Mathematics Grade 12

	symmetry, average gradient (average rate of change), intervals on which the function increases/ decreases.	**6.3.7.1** **6.3.7.2**
12.1 Functions: Exponential and Logarithmic	1. Revision of the exponential function and the exponential laws and graph of the function defined by: $y = b^x$, for $b > 0$ en $b \neq 1$. 2. Understand the definition of a logarithm: $y = \log_b x \Leftrightarrow x = b^y$, for $b > 0$ and $b \neq 1$. 3. The graph of the function define $y = \log_b x$ for both $0 < b < 1$ and $b > 1$.	**6.7.6.1** **6.7.6.2** **6.7.7** **5.5.1.1** **5.5.1.2** **5.5.1.3** **5.5.1.4** **5.5.1.5** **5.5.1.6** **5.5.1.7** **5.5.2.1** **5.5.2.2** **5.5.2.3** **5.5.2.4**
12.3 Finance, growth and decay	1. Solve problems involving present and future value annuities. 2. Make use of logarithms to calculate the value of n, the time period, in the equations: $A = P(1+i)^n$ of $A = P(1-i)^n$ 3. Critically analyze investment and loan options and make informed decisions as to best option(s) (including pyramid schemes)	**10.7.2.5** **10.7.2.6** **10.7.3.2** **10.7.3.3** **10.7.4.2**
12.9 Trigonometry	Compounded angle identities:	**7.5.4.1** **7.5.4.2** **7.5.4.3**

CAMI Education linked to CAPS: Mathematics Grade 12

	$\cos(\alpha \pm \beta) = \cos\alpha\cos\beta \mp \sin\alpha\sin\beta$ $\sin(\alpha \pm \beta) = \sin\alpha\cos\beta \pm \cos\alpha\sin\beta$ $\sin 2\alpha = 2\sin\alpha\cos\alpha$ $\cos 2\alpha = \cos^2\alpha - \sin^2\alpha$ $\cos 2\alpha = 2\cos 2\alpha - 1$ $\cos 2\alpha = 1 - 2\sin^2\alpha$	**7.5.4.4** **7.5.4.5** **7.5.4.6** **7.5.4.7** **7.5.4.9**
GRADE 12_ Term 2		
12.9 Trigonometry continue	1. Solve problems in two and three dimensions.	
12.1 Functions: Polynomials	Factorize third degree polynomials. Apply the remainder and factor theorems to polynomials of degree at most three (no proofs required)	**5.1.1.1** **5.1.1.2** **5.1.2.1** **5.1.2.2** **5.1.2.3** **5.1.2.4** **5.1.2.5** **4.6.3.3** **4.6.3.4** **4.6.3.5** **4.6.4.1** **4.6.4.2** **4.6.4.3**
12.5 Differential calculus	1. An intuitive understanding of the limit concept, in the context of approximating the rate of change or gradient of a function at a point. 2. Use limits to define the derivative of a function f at any x: $f'(x) = \lim_{h\to 0} \frac{f(x+h) - f(x)}{h}$ Generalize to find the derivative of f at any point x in the domain of f, i.e. define the derivative function $f'(x)$ of the	**5.6.1.1** **5.6.3.1** **5.6.3.2** **5.6.3.3** **5.6.3.4** **5.6.4.1** **5.6.4.2**

	function $f(x)$. Understand that $f'(a)$ is the gradient of the tangent to the graph of f at the point with x-coordinate a.	
	3. Using the definition, find the derivative, $f'(x)$ for a, b and c constants: $f(x) = ax^2 + bx + c$ $f(x) = ax^3$ $f(x) = \frac{a}{x}; x \neq 0$ $f(x) = c$	**5.6.4.3** **5.6.4.4** **5.6.4.5** **5.6.4.6** **5.6.4.7**
	4. Use the formula $\frac{d}{dx}(ax^n) = anx^{n-1}; n \in R$ Together with the rules: • $\frac{d}{dx}[f(x) \pm g(x)] = \frac{d}{dx}[f(x) \pm \frac{d}{dx}[g(x)$ • $\frac{d}{dx}[kf(x)] = k\frac{d}{dx}[f(x)]; k$ constant	
	5. Find equations of tangents to graphs of functions.	**5.7.1.1** **5.7.1.2**
	6. Introduce the second derivative • $f''(x) = \frac{d}{dx}[f'(x)]$ van $f(x)$ and how it determines the concavity of a function.	
	7. Sketch the graphs of cubic polynomial functions using differentiation to determine the coordinate of the stationary points, and points of inflection (where concavity changes). Also, determine the x-intercepts of the graph using the factor theorem and other	**5.7.2.1** **5.7.2.2** **5.7.4.1** **5.7.4.2**

	techniques. 8. Solve practical problems concerning optimization and rate of change, including calculus of motion.	**5.7.3.1** **5.7.3.2** **5.7.3.3** **5.7.3.4** **5.7.3.5** **5.7.3.6** **5.7.3.7** **5.7.3.8** **5.7.5.1** **5.7.5.2** **5.7.6.1** **5.7.6.2** **5.7.6.3**
12.8 Analytical Geometry	1. The equation $(x-a)^2+(y-b)^2=r^2$ defines a circle with radius r and centre $(a;b)$. 2. Determination of the equation of a tangent to a given circle.	**8.9.4.1** **8.9.4.2** **8.9.5.1** **8.9.5.2** **8.9.6.1** **8.9.6.2**
GRADE 12_Term 3		
12.7 Euclidian Geometry	1. Revise earlier work on the necessary and sufficient conditions for polygons to be similar. 2. Prove (accepting results established in earlier grade): • that a line drawn parallel to one side of a triangle divides the other two sides proportionally (and the mid-point theorem as a special case of this theorem). • that equiangular triangles are similar. • that triangles with sides in proportion are similar; and	

	• the Pythagorean Theorem by similar triangles. •	
12.10 Statistics (regression and correlation)	1. Revise: • dependant and independent events; • the product rule for independent events: $P(AenB) = P(A) \times P(B)$ • the sum rule for mutually exclusive events A and B : $P(AofB) = P(A) + P(B)$ • the identity: $P(AofB) = P(A) = P(B) - P(AenB)$ • the complementary rule: $P(nieA) = 1 - P(A)$ • 2. Probability problems using Venn diagrams, trees, two-way contingency tables and other techniques (like the fundamental counting principle) to solve probability problems (where events are not necessarily independent). 3. Apply the fundamental counting principle to solve probability problems.	**10.2.8** **10.2.9**
GRADE 12_Term 4		
Revision		
Examination		