Scheme of Work Form 4 Add Maths Term3 2019-2020

SECTION 2: Trigonometry (Excerpted CSEC Syllabus effective May 2021)
GENERAL OBJECTIVES

On completion of this Section, students should be able to:

1. Define the radian;

2. Convert degrees to radians and
   radians to degrees;

3. Use the formulae for arc length
   $l = r\theta$ and sector area
   $A = ½\, r2\theta$;
   Applications of arc length and sector area.

4. Evaluate sine, cosine and
   tangent for angles of any size
   given either in degrees or
   radians

5. Evaluate the exact values of sine,
   cosine and tangent for special angles

6. Draw the graphs of the functions
   $sin\, kx, cos\, kx, tan\, kx$, where
   k is 1 or 2
   for the range $0 \le x \le 2\pi$;

7. Derive the identity
   $cos^2\theta + sin^2\theta = 1$

8. Use the identity tan $\theta = sin\theta/cos\theta$

9. Use the formulae for
   sin $(A \pm B)$,
   $cos\, (A \pm B)$ and
   $tan\, (A \pm B)$.
   Compound-angle formulae.

10. Derive the multiple angle identities
    for $\sin 2x$, $\cos 2x$, $\tan 2x$;
    Double-angle formulae.

11. Using Specific Objectives 7, 8 and 9
    above prove simple identities; and,

12. Find solutions of simple
    trigonometric equations for the
    range $0 \leq \theta \leq 2\pi$, including
    those involving the use
    $\cos^2 \theta + \sin^2\theta = 1$.

SECTION 3: INTRODUCTORY CALCULUS (Time permitting)

SPECIFIC OBJECTIVES CONTENT

Differentiation
Students should be able to:

1. use the concept of the derivative at a point $x = c$ as the gradient
   of the tangent to the graph at $x = c$;
   The gradient of a curve.

2. define the derivative at a point as a limit;

3. use the $f'(x)$ and dy/dx notation for the first derivative of $f(x)$;

4. use $d/dx\ x^n = n\,x\,^{n-1}$ where n is any real number;

5. use $d/dx \sin ax = a \cos ax$ and $d/dx \cos ax = -a \sin ax$;

6. use simple rules of differentiation to find derivatives of sums and
   multiples of function;
   Simple rules of differentiation:
   Differentiation of simple polynomials and
   trigonometric functions involving sine and cosine only.

7. apply the chain rule in the differentiation of composite functions;
   Function of a function, the chain rule.

8. differentiate products and quotients of simple polynomials and trigonometric functions;
   Product and quotient rules.

9. determine the equations of tangents and normals to curves;
.
10. calculate the second derivative, Second derivatives of functions.

11. use the concept of the derivative