SIR ARTHUR LEWIS COMMUNITY COLLEGE

ACADEMIC YEAR (2024/2025) – SEMESTER ONE

END OF SEMESTER EXAMINATION

COURSE CODE : **MAT139**

COURSE TITLE : **Trigonometry**

LECTURER(S) : **Antonia, Laurent-Goodman**

DATE : **10th December 2024**

TIME : **9 a.m. – 11 a.m.**

DURATION : **2 hours**

STUDENT ID # : _____

GENERAL INFORMATION AND INSTRUCTIONS

- Students must sign **IN** and **OUT** on the examination class list.
- Write your ID number on the question paper.
- Answer ALL questions in the space provided using **BLUE** or **BLACK** ink

Question #	**Maximum Mark**	Student Mark
1.	**18**	
2.	**5**	
3.	**7**	
4.	**10**	
5.	**10**	
TOTAL (SECTION A)	**50**	

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

1. Find all the values of θ in the interval $0 \leq \theta < 360°$ for which

(a) $\cos(\theta - 10°) = cos15°$ [4]

(b) $\tan 2\theta = 0.4$ [5]

(c) $2 \sin\theta \tan\theta = 3$ [9]

2. Without using calculators evaluate $\sin 75° - \sin 15°$

[5]

3. In the triangle $ABC, AB = 11cm, BC = 7cm \text{ and } CA = 8cm$.

(a) Find the size of the angle C, giving your answer in radians to 3 significant figures

[4]

(b) Find the area of triangle ABC, giving your answer in cm^2 to 3 significant figures

[3]

4. (a) Express $7\,cosx - 24\sin x$ in the form $R\cos(x+\propto)\ where\ R > 0\ and\ 0 < \alpha < \frac{\pi}{2}$.
Give the value of α to 3 decimal places [3]

(b) Hence write down the minimum value of $7\,cosx - 24\sin x$ [1]

(c) Solve, for $0 \leq x < 2\pi$, the equation $7\,cosx - 24\sin x = 10$ giving your answers to 2 decimal places. [6]

5. (a) Show that the equation $cos^2 x = 8 sin^2 x - 6 \sin x$ can be written in the form

$$(3 \sin x - 1)^2 = 2$$ [4]

(b) Hence solve for $0 \leq x < 360°$ [6]

END OF EXAM