



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

CERTIFICATE IN BUILDING AND CIVIL ENGINEERING

AMA 1150 : ENGINEERING MATHEMATICS I

END OF SEMESTER EXAMINATION

SERIES:AUGUST₂₀₁₉

TIME:2 HOURS

DATE:2019

Instructions to Candidates

You should have the following for this examination:

Answer Booklet, examination pass and student ID

This paper consists of five questions.

Attempt any **THREE** questions

Do not write on the question paper.

QUESTION ONE

a). Solve the following simultaneous equations:

$$3u - 3v - 2w = 3$$

$$2u + 3v + 2w = 7$$

$$U - v + w = 6$$

(10mks)

b). Solve $2x^2 + 8 = -10x$ by factorization method.

(6mks)

c). Evaluate the following without using tables

(i) $\log_{8/9}(64/81) = x$

(ii) $\log_{15}1 = x$

(4mks)

QUESTION TWO

a) Show that $\tan 75^\circ = \frac{1+\sqrt{3}}{\sqrt{3}-1}$

(8mks)

b) Show that $\tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$

(12mks)

QUESTION THREE

a). Show that the data:

x	1	2	3	4
y	0.25	2	6.75	16

a) Satisfies a law of the form $y = x^3 + b$ and find the values of the constant.

(15mks)

b). Find the value of y when $x = 2.6$ and x when $y = 10.5$

(5mks)

QUESTION FOUR

a). Find the sum of the following series:

$$3 + 4.5 + 16 + \dots \text{ upto } 12^{\text{th}} \text{ term.}$$

(6mks)

b). In an A.P the sum of 15 terms is 555. If the common difference is 4, find the first and fourth terms.

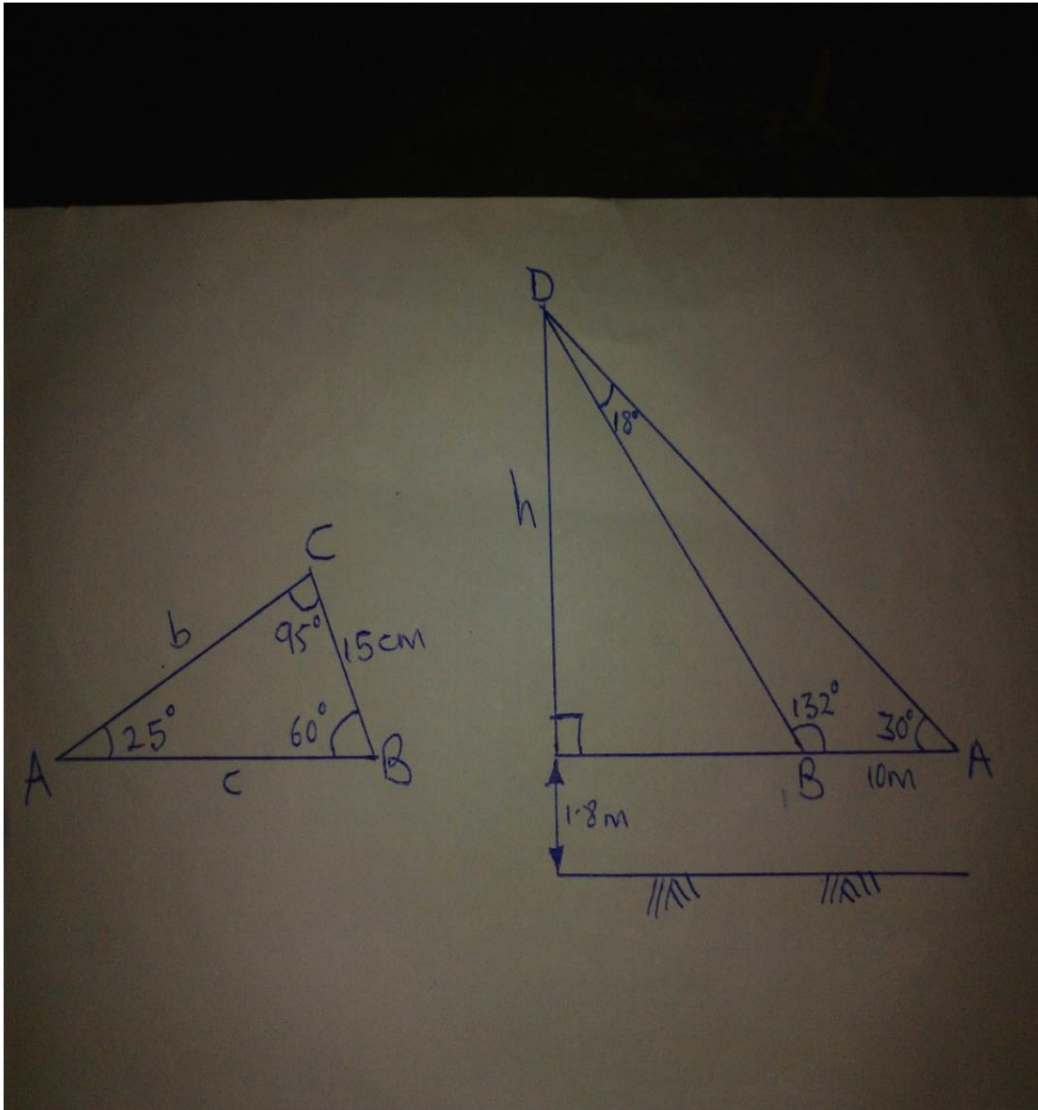
(4mks)

c) Find THREE numbers in a geometric progression such that their sum is 26 and their product is 216.

(10mks)

QUESTION FOUR

a). Determine the value of b , c and h in the following figures. **(8mks)**



b) Show that $\sin(A+B) = \sin A \cos B + \cos A \sin B$. **(12mks)**