FORM 4
NAME: ……ADM:……DATE:…….

1. Use logarithms to 4 decimal places to evaluate: (4 marks)

$$\left(\frac{0.7841\times\sqrt{0.1356}}{Log\ 84.92}\right)^{\frac{1}{3}}$$

2. A globe representing the earth has a radius of 0.5m. point A(0^0, 10^0W), B (0^0, 35^0E), P(60^0N, 110^0E) and Q(60^0N, 120^0W) are marked on the globe.

a) Find the length of arc AB, leaving your answer in term of π (3mks)

3. A circle centre is the point C(2,3) passes through a point P(a,b). A point M(-2 , $\frac{-5}{2}$) is the mid-point of the line CP.

a) Calculate the coordinates of P. (1mk)

b) Determine the equation of the circle in the form $x^2+y^2+ax+by+c=0$ (3mks)

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4. Make **a** the subject of the formula:

$x = y + \sqrt{x^2 + a^2}$ (3marks)

5. Given that Sin $\left(\frac{2}{3}x + 20^0\right)$ – Cos $\left(\frac{5}{6}x + 10^0\right)$ = 0. Without using a mathematical table or a calculator, determine tan $(x + 20^0)$. (3 marks)

6. Two fair dice one a regular tetrahedron (4 faces) and the other a cube are thrown. The scores are added together. Complete the table below to show all possible outcomes. (2 mark)

TETRAHEDRON \ CUBE	1	2	3	4	5	6
1						
2						
3						
4						

a) Find the probability that:

i) The sum is 6. (1 mark)

iii) The sum is 6 or 9. (2 marks)

7. A particle moves along a straight line such that its displacement s metres from a given point is $s = t^3 - 5t^2 + 3t + 4$ where t is time in seconds. Find:

(a) The displacement of the particle at t = 8. (2 marks)

(b) The velocity of the particle when t = 10. (3 marks)

8. A classroom measures (x + 2) m by (x – 5)m. If the area of the classroom is $60m^2$.

Find its length. (3 marks)

SECTION B

Lengths of 100 mango leaves from a certain mango tree were measured t the nearest centimeter and recorded as per the table below,

Length in cm	No. of leaves
10 to 12	3
13 to 15	16
16 to 18	36
19 to 21	31
22 to 24	14

a) On the grid provided draw a cumulative frequency graph to represent this data. (5mks)

b) Use your graph to estimate

i) The median length of the leaves (2mks)

ii) The number of leaves whose lengths lie between 13cm and 17cm. (3mks)

(a) Draw ΔPQR whose vertices are P (1, 1), Q (-3, 2) and R (0, 3) on the grid provided.(1mk)

(b) Find and draw the image of ΔPQR under the transformation whose matrix is $\begin{pmatrix} 3 & 0 \\ 1 & 1 \end{pmatrix}$ and label the image $P^1Q^1R^1$. (2 marks)

(c) $P^1Q^1R^1$ is then transformed into $P^{11}Q^{11}R^{11}$ by the transformation with the matrix $\begin{pmatrix} -1 & 0 \\ 1 & 3 \end{pmatrix}$. Find the co-ordinates of $P^{11}Q^{11}R^{11}$ and draw $P^{11}Q^{11}R^{11}$. (3 marks)

(d) Describe fully the single transformation which maps PQR onto $P^{11}Q^{11}R^{11}$ find the matrix of this transformation. (3 marks)

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(3 marks)