MATHEMATICS PAPER 2 - 2019 KCSE TAP TRIAL MOCK EXAMS (QUESTIONS AND ANSWERS)

INSTRUCTIONS TO CANDIDATES

- This paper contains TWO sections: section I and section II
- Answer all the questions in section I and any FIVE questions from section II.
- Show all the steps in your calculations, giving your answers at each stage in the spaces provided below each question.
- Marks may be given for correct working even if the answer is wrong.
- Non-programmable silent electronic calculators and KNEC mathematical tables may be used except where stated otherwise.

SECTION I: (50 MARKS)
Answer ALL Questions in this section

1. Use logarithm table to evaluate: (4mks)

$$\sqrt{\left(\frac{0.7493\cos^2 16.335^0}{\text{Log } 559.3 + 10\tan 3^0}\right)}$$

2. What must be added to $\frac{1}{4}x^2 + \frac{1}{9}$ in order to make it a perfect square?   (2mks)

3. Expand $(x - \frac{a}{x^2})^6$ in ascending powers of x, up to the term independent of x. If this independent term is 1215, find the value of a. (3mks)

4. An angle of 1.75 radians at the centre of a circle subtends an arc of length 24.8cm. Find the diameter of the circle. (2mks)

5. ABCDEFG is a rectangular box in which AB, AD, AE are 3cm, 4cm and 5cm long respectively. M is the midpoint of FG.
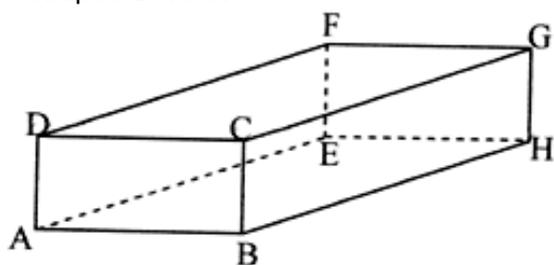
   Find the length AM and determine the inclination of AM to EFGH.   (3mks)

6. Use square roots, reciprocals and square tables to evaluate the expression: (3mks)

$$(0.00546667)^{\frac{1}{2}} \quad + \quad \left(\frac{3}{0.043279}\right)^2$$

7. A member of a county assembly sold his car for shs. 1,250,000 and deposited this money in a savings account in one of the banks in Kaiboi town. The banks paid 18%p.a compounded quarterly. After two years, the member of the county assembly withdrew a half of the amount from the account. He left the rest for a further two and a half years. Calculate the total interest he earned in the 4½ year period. (4mks)

MARKING SCHEME

NO	WORKING	MARKS	COMMENTS

1	Log 559.3 = 2.7476
	10 tan 3° = 10 x 0.0524
	    = 0.524
	
	⇒ 2.7476
	  + 0.5240
	    3.2716
		M1	✓Working out the denominators to get 3.2716

	$\dfrac{0.7493 \cos^4 16.3350}{3.2716}$
	No. Std. form Log
	0.7493 7.493 x 10⁻¹ 1.8747
	Cos⁴16.335 2(1.982) 1.9642 +
	                                   1.8389
	3.2716 3.2716 x 10⁰ 0.5148 -
	                                   1.3241
		M1	✓For attempt to add and subtract correctly.

	$\dfrac{-1 + 0.3241}{2}$ = 1.6621 = 10⁻¹ x 4.593	M1	✓Division by 2
	= 0.4593	A1	CAO
		04	
2	¼x² + ¹/₉ ¼ x² + k + ¹/₉ a + 2ab + b² a² = ¼ x b² = ¹/₉ 2ab = k 2 x ½ x ¹/₃ = k k = ¹/₃ x	M1 A1	
		02	
3	$x^6, x^5\left(\dfrac{-a}{x^2}\right), x^4\left(\dfrac{a}{x^2}\right)^2, x^3\left(\dfrac{-a}{x^2}\right)^3, x^2\left(\dfrac{a}{x^2}\right)^4, x\left(\dfrac{-a}{x^2}\right)^5\left(\dfrac{a}{x^2}\right)^6$ $1.x^6 - 6.x^5\left(\dfrac{a}{x^2}\right) + 15x\left(\dfrac{a}{x^2}\right)^2 - 2x\left(\dfrac{a}{x^2}\right)6 + 15x\left(\dfrac{a}{x^2}\right)^4 - 6x\left(\dfrac{a}{x^2}\right)^5 + 1\left(\dfrac{a}{x^2}\right)^6$	B1	For items and coefficients combined correctly
	$x^6 - \dfrac{6ax^5}{x^2} + 15x^4\dfrac{a^2}{x^4} - 20x^3\dfrac{a^3}{x^6} + 15x^2\dfrac{a^4}{x^8} - \dfrac{6xa^5}{x^{10}} + \dfrac{a^6}{x^{12}}$ $x^6 - 6ax^3 + 15a^2 \quad— \quad \dfrac{20a^3}{x^3} + \dfrac{15a^4}{x^6} - \dfrac{6a^5}{x^9} \times \dfrac{a^6}{x^{12}}$ 15a² = 1215	M1	Equating to 1215
	a² = 81 a = ±9	A1	C.A.O (±9)
		03	