Name:……………………………………………………… ADM No:………... Date:…………..

**TERM I**

**FORM 3**

**MATHEMATICS**

**Time: 2 Hours**

**TEACHER.CO.KE**

**MATHEMATICS**

**Time: 2 Hours**

***Instructions To Candidates***

*Write your name, class and admission number in the space provided at the top of this page.*

*This paper has two sections: Section 1 and Section II*

*Answer all questions in section I and any three questions in section II*

*All answers and working must be written on the question paper in the spaces provided below each question.*

*Show all the steps in your calculations, giving your answer at each stage in the space below each question.*

*Marks may be awarded 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.*

**For examiners use only**

**GRAND**

**TOTAL**

**SECTION I (40MKS)**

***(Answer all questions from this section)***

1. Use logarithms to evaluate (3mks)

$$\frac{4.73×22.41}{82.3}$$

1. Solve for x in $log\_{3}81=x$ (3mks)
2. Use tables of cubes and reciprocals to evaluate (4mks)

$$\sqrt[2]{0.498}+\frac{0.1}{0.0351}$$

1. When a number is divided by 8, 9 and 6 the remainders are 7, 8 and 5 respectively. Find the number.

 (3mks)

1. A line with gradient -3 passes through (3, k) and (k, 8). Find the value of k and hence the equation of the line, where a, b and c are constants. (4mks)
2. In a fundraising committee of 45 people, the ratio of men to women is 7: 2. Find the number of women required to join the committee so that the ratio of men to women is changed to

 5: 4. (3mks).

1. The marked price of a car in a dealer’s shop was Ksh. 450 000. Simiyu bought the car at 7% discount. The dealer still made a profit of 13%. Calculate the amount of money the dealer had paid for the car to the nearest thousands. (4mks)
2. The size of an interior angle of a regular polygon is 3x0 while that of exterior is (x-20)0. Find the number of sides of the polygon. (3mks)
3. The GCD and LCM of three numbers are 3 and 1008 respectively. If two of the numbers are 48 and 72, find the least possible value of the third number. (3mks)
4. A straight line through A(2, 1) and B(4, m) is perpendicular to the line whose equation is $3y=5-2x$. Determine the value of m. (3mks)
5. Two similar solids have surface areas of 48cm2 and 108cm2 respectively. Find the volume of the smaller solid if the bigger one has a volume of 162cm3. (3mks)
6. Given that $\cos(\left(x-20\right)°)=sin⁡(2x+32)°$ and that x is an acute angle, find $tan⁡(x-4)°$ (4mks)

**SECTION II (30MKS)**

***(Answer any 3 questions from this section)***

1. The coordinates of a triangle ABC are A(1, 1) B(3, 1) and C (1, 3).

(a) Plot the triangle ABC. (1 mark)

(b) Triangle ABC undergoes a translation vector$ \left(\begin{matrix}2\\2\end{matrix} \right)$. Obtain the image of A' B' C ' under the transformation, write the coordinates of A' B' C'. (2 marks)

(c) A' B' C' undergoes a reflection along the line X = 0, obtain the coordinates and plot on the graph points A" B" C", under the transformation (2 marks)

(d) The triangle A" B" C" , undergoes an enlargement scale factor -1, centre origin. Obtain the coordinates of the image A'" B"' C"'. (2 marks)

(e) The triangle A"' B"' C"' undergoes a rotation centre (1, -2) angle 1200. Obtain the coordinates of the image Aiv Biv Civ. (2 marks)

(f) Which triangles are directly congruent. (1 mark)

1. A country bus left town A at 11.45 am and travelled towards town B at an average speed of 60km/hr. A matatu left town B at 1.15 pm on the same day and travelled towards town A along the same road at an average speed of 90km/hr. The distance between the two towns is 540 km. Determine
2. The time of the day the two vehicles met. (4marks)
3. How far from town A they met. (2marks)
4. How far from town B the bus was when the matatu reached town A (4marks)
5. The table below shows the mass to the nearest gram, of 101 mango seeds in a research station.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Mass(gram) | 10 -14 | 15 -19 | 20 - 24 | 25 - 29 | 30 -34 | 35 – 39 |
| Frequency | 2 | 14 | 33 | 35 | 14 | 3 |

1. State the modal class. (1mark)
2. Calculate to 2 decimal places:
3. The mean mass (4marks)
4. The difference between the median mass and the mean mass. (5marks)
5. A helicopter is stationed at an airport H on a bearing of 060o and 800km from another airport P. A third airport J is on a bearing of 140o and 120km from H.
	1. Using a scale of 1cm represents 100km;
		1. Show the relative positions of **P**, **H** and **J** (3mks)
		2. Determine the distance between **P** and **J** (2mks)
		3. State the bearing of **P** from **J** (2mks)

(b) A jet flying at a speed of 103km/h left **J** towards **P**. The helicopter at H also took off towards P at the same time. Find the speed at which the helicopter will fly so as to arrive at P 12 minutes later than the jet. (3mks)

1. Given that $y=2x^{2}+3x-7$ for -4$\leq x \leq 3$
	1. Complete the table below (2mks)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| x | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
| 2x2 | 32 | 18 |  |  |  | 2 |  | 18 |
| 3x |  | -9 |  | -3 |  | 3 | 6 |  |
| -7 | -7 | -7 | -7 | -7 | -7 |  | -7 | -7 |
| y |  | 4 | -5 |  | -7 |  | 7 |  |

* 1. Draw the graph $y=2x^{2}+3x-7$ for $-4\leq x \leq 3$ (3mks)
	2. Use the graph to find the roots of the equation
		1. $2x^{2}+3x-7=0$ (2mks)
		2. $2x^{2}+4x-9=0$ (3mks)