

MATHEMATICS FORM 2

OPENER EXAM TERM 2 2023

 NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_STREAM\_\_\_\_\_\_DATE:\_\_\_\_\_\_\_\_\_\_

SCHOOL:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 **TIME: 2 ½ HOURS**

**Instructions to candidates**

1. *Write your name, admission no. and class in the spaces provided.*
2. *Sign and write the date of examination in the spaces provided above*
3. *The paper contains two sections; Section I and II.*
4. *Answer all questions in Section I and II*
5. *All answers and working must be written on the question paper in the spaces provided below each question.*
6. ***Show all the steps in your calculations, giving your answers at each stage in the spaces provided below each question***
7. *KNEC Mathematical tables may be used, except where stated otherwise*
8. *Silent or non-programmable calculators* ***SHOULD NOT*** *be used*

**FOR EXAMINER’S USE ONLY**

**SECTION I**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | **TOTAL** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**SECTION II**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 17 | 18 | 19 | 20 | 21 | **TOTAL** |
|  |  |  |  |  |  |

|  |
| --- |
| **GRAND TOTAL** |
|  |

 **SECTION I (50 MARKS)**

1. Using mathematical tables; find (4 marks)

 (0.0546) 0.5 + (2/4.327)2

1. Solve the equation; (3 marks)

$$\frac{x-2}{3}- \frac{3-x}{4}= \frac{x- 2}{2}$$

1. 3g of metal A of density 2.7g/cm3 is mixed with 2.4dm3 of metal B of density 4.8g/cm3. Determine the density of the mixture. (3 marks)

1. Korir is now four times as old as his daughter and six times as old as his son. Twelve years from now, the sum of the ages of his daughter and son will differ from his age by 9 years. Determine present ages. (3marks)
2. Convert 2.2 $\dot{2}\dot{3}$ into an improper fraction. (3 marks)
3. Evaluate $^{1}/\_{3}$ of $\left(2^{3}/\_{4}- 5^{1}/\_{2}\right)$ x 3$^{6}/\_{7}$ $÷ ^{9}/\_{4}$ (3 marks)
4. Evaluate ; (3 marks)

 $\left(\frac{2}{5}\right)^{-3}$x $\left(\frac{4}{5}\right)^{2}$x $\left(32\right)^{^{2}/\_{5}}$

1. Cynthia exchanged Ksh.600,000 to Sterling pounds. After settling the bills worth £1200, she changed the balance to Euros. She then purchased goods worthy 200 Euros. Using the exchange rates below, calculate her balance in Kenyan shillings. (3 marks)

|  |  |  |
| --- | --- | --- |
|  | Buying (Ksh) | Selling (Ksh) |
| 1 Sterling pound | 114.20 | 114.50 |
| 1 Euro | 101.20 | 101.30 |

1. Find the equation of line whose gradient is $^{-3}/\_{2}$ and y – intercept is 2. Give the answer in the form y = mx + c. (4 marks)
2. In a month of March a motorbike salesman sold 3 motorbikes, one at Kshs 150,000, the second at Kshs 120,000 and the other Kshs 100,000. If he is paid a salary of Ksh 15,000 and a commission of 10% how much did he get during the month of March? (3 marks)
3. A cylindrical tank has a diameter of 700cm and can hold 120,000l of water. What is the height of the water tank in meters to four significant figures? (Take $π= \frac{22}{7}$) (3 marks)
4. Two similar solids weigh 625g and 40g respectively. If the surface area of the smaller solid is 4.8cm2. Determine the surface area of the larger one. (3 marks)
5. Evaluate $\frac{-10-\left( -6\right)x \left(-6\right)÷ -2+(-18)}{-8+\left(-6\right)÷\left(-2\right) x 2}$ (3 marks)
6. The figure below shows the sketch of a net of a solid (measurement in centimeters)

 3cm 5cm

|  |  |  |
| --- | --- | --- |
|  |  **4** |  |

3cm

 3cm 5cm

Below is part of a sketch of the solid whose net is shown above. Complete the sketch of the solid showing the hidden edges with broken lines. (4 marks)

1. Given that (5m - 2n): (2m - n) = 7: 5. Find the ratio m: n. (2 marks)
2. The size of an exterior angle is 1/3 of the interior angle of a regular polygon. Determine the number of sides of the polygon. (3 marks)

**SECTION II (50 MARKS)**

***Answer all the questions from this section***

1. Ariell is a sales executive earning a salary of Kshs. 20,000 and a commission of 8% for the sales excess of Kshs. 100,000. If in May he earned a total of Kshs, 48,000 in salaries and commission
	1. Determine the amount of sales he made in that month. (4 marks)
	2. If the total sales in the months of June and July increased by 18% and then dropped by 30% respectively. Calculate.
		1. Ariell’s commission in the month of June. (3 marks)
		2. His total earnings in the month of July. (3marks)
2. Town B is 20km N600W from village A. Town B is 25km 0400 from town C. Village D is due East of town C and dues South of village A
3. Using a scale 1:500,000 draw a diagram showing a relative position of town B,

town C, village A and village D (4 marks)

1. Determine;
2. Distance between village A and town C (2 marks)
3. Distance between town C and village D (2 marks)
4. Compass bearing of town C from village A (1 mark)
5. Compass bearing of village D from town B (1 mark)
6. A Rhombus has its vertices as PQRS. The co-ordinates of the vertex P and Q of the rhombus are P(-1, 3) and Q(2, 4). The diagonal QS and PR meet at point M. Given that the equation of the line PR is y = x + 4.

a) Find the equation of the diagonal QS. (1 mark)

b) Find the co-ordinates of the mid-point M of QS. (2 marks)

c) Find the co-ordinates of the points R and S. (4 marks)

d) Calculate the length of diagonal PR. (3 marks)

1. A triangle has vertices A(-4, -1), B(-1, -3), C(-2, -1).

a) Draw triangle ABC on the graph below. (1 mark)



b) Plot the image A1B1C1 of triangle ABC under reflection in the line y = - x. (3marks)

c) Plot the image A11B11C11 of triangle A1B1C1 under rotation of +90 about the origin. (3 marks)

d) Plot the image A111B111C111 of A11B11C11 under enlargement scale factor -2 and centre (1, 0). (3 marks)

1. The ratio of men to women in a self-help group is 8:13. Two more men joined the group while 5 women left it. The new ration of men to women in the group is 7:10.

a) Find the original:

i) Number of men in the group (4 marks)

ii) Number of women in the group (2 marks)

iii) Original number of members in the group. (2 marks)

b) Determine the new number of members in the group. (2 marks)