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**Name……………………………………… Adm. No:……...**

**School: …………………………………… Date……………...**

**121/1**

**MATHEMATICS**

**PAPER 1**

**2 ½ HOURS**

***FORM THREE MATHEMATICS CONTEST—2019***

*Kenya Certificate of Secondary Education (K. C. S. E)*

**Instructions to candidates**

1. *Write your* ***name, admission number anddate of examination****in the spaces provided above.*
2. *The paper contains two sections* ***A****and* ***B.***
3. *Answer* ***all*** *questions in section* ***A****and* ***only five*** *questions in section* ***B.***
4. *All workings and answers must be written on the question paper in the spaces provided below each question.*
5. *Marks may be awarded for correct working even if the answer is wrong.*
6. *Negligence and slovenly work will be penalized.*
7. ***Non programmable*** *silent electronic calculators and mathematical tables are allowed for use.*
8. *This paper consists of* ***15*** *printed pages. Candidates should check to ensure that all pages are printed as indicated and no questions are missing.*

FOR EXAMINER’S USE ONLY

SECTION A

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

SECTION B

**GRAND TOTAL**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | TOTAL |
|  |  |  |  |  |  |  |  |  |

**SECTION A (50MARKS)**

**Answer *ALL* questions in this section**

1. Evaluate without using mathematical table or calculator (3mks)

$$\frac{0.036×0.0049}{0.07×0.048}$$

1. Use tables of reciprocals and cube roots to evaluate (4mks)

$$\frac{4}{25.34}+\sqrt[3]{0.03154}$$

1. Determine the value of $θ$in the equation below (3mks)

$$Sin(2θ^{0}-30^{0})-Cos⁡(3θ^{0}+20^{0})=0$$

1. Given that $t=2i-j$and $r=i+3j$**,** find;(3mks)

$$\left|2t-\frac{1}{2}r\right|$$

1. Solve the inequality below and state all the integral values of x that satisfy the inequality (3mks)

$$2x+4<4x-2\leq 18-x$$

1. The LCM of two numbers is 240 while their GCD is 12. If one of the numbers is 144, determine the other possible number. (3mks)
2. By giving a reason, find the value of x in the figure below (2mks)



1. Use completing the square method to solve the following quadratic equation $2x^{2}+8x-4=0$ (3mks)
2. Wanjiru, Atieno and Jeptoo shared the profit of their business in the ratio 3:5:9respectively. If Atieno received sh.6000, how much did the business yield? (3mks)
3. A line passing through point A(-1,3k) and B(k,3) is parallel to a line whose equation is

$2y+3x=9$. Determine the coordinates of point A and B. (4mks)

1. The sum of interior angles of a regular polygon is 10800
2. Find the size of each exterior angle (3mks)
3. Give the name of the polygon (1mk)
4. Without using mathematical tables or calculator, solve for x; (3mks)

$$log\_{10}\left(3x+4\right)+log\_{10}\left(3-x\right)-log\_{10}10=0$$

1. A solid metal cuboid measuring 7.2cm long, 4.8cm wide and 2.4cm high is melted and recast into a spherical ball. Calculate to the nearest one decimal place the radius of the ball. (3mks)
2. The diagonals of a rhombus are 14cm and 9cm. Calculate the area of the rhombus (2mks)
3. Solve for x in the equation. (3mks)

$$27^{x}+3^{3x}-5=49$$

1. Factorize completely (4mks)

$$\frac{15x^{2}-xy-6y^{2}}{9x^{2}-4y^{2}}$$

**SECTION B (50 MARKS)**

**Attempt *ANY FIVE* questions in this section**

1. Construct a parallelogram ABCD such that AB=6cm, BC=8cm and angle $∠ABC=67.5^{0}$ (3mks)
2. Measure length of diagonal CA and $∠CAB$ (2mks)

CA=................................ $∠CAB$..............................

1. Drop a perpendicular from point **m**(point of intersection of the diagonals of the parallelogram) to meet AB at**p**. Measure length **MP**  (2mks)

MP =\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm

1. Find the area of triangle ACD in $m^{2}$ (3mks)
2. Given that $y=-x^{2}+3x+7$, complete the table below. (2mks)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| $$y=-x^{2}+3x+7$$ | -11 |  |  | 7 |  |  | 7 |  |  | -11 |

1. On the grid provided, draw the graph of$y=-x^{2}+3x+7$ (3mks)



1. Sate the roots of the curve given that $-x^{2}+3x+7=0$ (1mk)
2. Use your graph to solve the following equations
3. $x^{2}-4x-3=0$ (2mks)
4. $y=4+x$ (2mks)
5. Below is a bucket in frustum shape with top r=28cm and bottom r=21cm. The perpendicular height of the pale is 90cm.



1. Determine the total surface area of the bucket (5mks)
2. Determine the capacity of water that can fill the bucket (5mks)
3. Four towns P, Q, R and S are such that town Q is 120km due east of town P while town S is on a bearing of 3300 and 150km from P. Town R on the other hand is on a bearing of 700from S and due north of Q.
4. Use a ruler and a pair of compasses only to accurately show the positions of these four towns by scale drawing (take 1cm rep 50km) (5mks)
5. Determine;
6. The distance SR (2mks)
7. The distance SQ (2mks)
8. The bearing of town S from Q (1mk)
9. The campus bearing of P from R (1mk)
10. The figure below shows intersecting circles centre O1 and O2 with radius $8cm$ and $6cm$ respectively and length $AB=10cm$

 

1. Determine
2. The size of $∠AO\_{1}B$ (2mks)
3. The size of $∠AO\_{2}B$ (2mks)
4. Calculate the area of the shaded part (6mks)
5. A kite ABCD has vertices at A(3,0), B(4,2), C(3,3) and D(2,2). Draw the kite on the grid provided. (1mk)



1. On the same axes, draw the image A1B1C1D1 of ABCD under rotation of +900 about the origin and **state its coordinates**. (3mks)
2. Draw the image A11B11C11D11 of A1B1C1D1 under reflection in the line $y=x$ and **state its coordinates** (3mks)
3. Draw the image A111B111C111D111 of A11B11C11D11 under enlargement scale factor -2 centre (1,-2) **state its coordinates** (3mks)
4. The distance between town A and B is 720km. A bus left town A at 7.30am and traveled at a speed of 90km/h towards B. 30mins later, a car left town B towards A at a speed of 120km/h.
5. Find the time of the day when the bus arrived in town B. (2mks)
6. Calculate the relative distance of the two vehicles. (2mks)
7. Determine the time of the day when the car met with the bus. (3mks)
8. Find the distance of the bus from town B when the car arrived in town A. (3mks)
9. The histogram below represents marks obtained in a certain test.



1. Develop a frequency distribution table for the data. (4mks)
2. Calculate the mean (3mks)
3. Find the median mark (3mks)