**NAME....................................................................... INDEX NO .....................................**

**SCHOOL......................................................................................... Date ...............................**

**TRIAL ONE EVALUATION TEST**

**MATHEMATICS PAPER 2**

**TIME 2 ½ HOURS**

***Instructions to candidates:***

1. Write your name and index number in the spaces provided above in this page.
2. The paper consists of two sections; section 1 and 2
3. Answer all questions in section 1 and only five questions in section 2.
4. All working and answers must be written on the question paper in the spaces below each question.
5. Marks may be given for correct working even if the answer is wrong.
6. Use mathematical tables and electronic calculator where necessary.

For examiners use only

**Section 1**

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

**Section 2**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | **Total**  |
|  |  |  |  |  |  |  |  |  |

|  |
| --- |
|  |

 **Grand**

 **Total**

**Section 1 ( compulsory section – 50 marks)**

1.Solve the equation - = 4 (2mks)

2. If point A (1,3), B(5, -2) and C(-11, y) are collinear, calculate the value of y. (3mks)

3.Simplify (3mks)

4.Vector **a**  passes through the point (5,10) and (3,5) and vector **b** passes through (x, 6) and (-5, -4). If a and b are parellel, find the value of x. (3mks)

5.Make t the subject of the formula

P =

6.Find the equation of a line that passes through (3,7) and which is perpendicular to another line whose equation is 3y = 9x -5. (3mks)

7.Two similar containers have masses of 256kg and 108kg respectively. If the surface area of the smaller container is 810cm2, calculate the surface area of the larger container.(3mks)

8.In the figure below, O is the center of the circle <BCA =80º and <CBO =10º. Determine the size of < CAB (3mks)

9.Expand (1 –a)8 Hence use the expansion to evaluate 0.988 to 4 Significant figures. (4mks)

10.Simplify the expression

giving your answer in the for a+b,where a, b and c are real numbers (3mks)



11.The dimensions of a rectangle are given as 12.5cm and 6.75cm respectively. Calculate the percentage error in its area correct to 2 decimal places (4mks)

12.Factorise the expression 2x2 + x – 15, and hence value the equation 2x2 + x – 15 = 0 (3mks)

13.Find the integral value of x for which. (3mks)

5 ≤ 3x + 2

3x – 7 ≤ 2

14. Wanjiru Ayuma and Atieno shared the profits from their joint business in the ratio 3:7:9 respectively. If Ayuma received sh. 60,000. Find how much profit they realized. (2mks)

15. Basket A contain 5 oranges and 3 lemons while basket B contain 4 oranges and 3 lemons. A basket is selected at random and two fruits picked from it, one at a time without replacement. Find the probability that the fruits picked are of the same type. (3mks)

16.The fiqure below shows atringle PQR, PR = 15CM, TR= 5cm and ST is parallel to QR. If the area of triangle PQR is 315cm2 find the area of the quadrilateral QRTS.(4mks)

**SECTION II (Attempt only five questions 50)**

17.Using a ruler and a pair of compasses only construct a triangle ABC in which BC = AC= 6cm and <ACB = 135º measure AB. (3mks)

a)Measure AB (3mks)

b)From A drop aperpendicular to meet BC, extended at D.(3mks)

c)Measure the length of AD (1mk)

ii) Calculate the area of the triangle ABC. (3mks)

18.The table below shows marks scored by 38 students in a test.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 35 | 47 | 69 | 57 | 75 | 58 | 48 | 56 |
| 46 | 49 | 81 | 67 | 63 | 56 | 80 | 72 |
| 62 | 70 | 46 | 26 | 41 | 58 | 68 | 73 |
| 64 | 49 | 64 | 54 | 74 | 35 | 51 |  |
| 25 | 41 | 61 | 56 | 57 | 28 | 40 |  |

a)Starting with the mark of 25 and using a class internal of 10, make a frequency distribution table. ) (3mks)

b)State the modal class. (1mk)

c)Calculate the mean mark. (3mks)

d)Calculate the median mark. (3mks)

19.a) Complete the table below for the equation y = x3 + 4x2 – 5x – 5 for the range -5 ≤ × ≤ 2 (2mks)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
| Y |  |  | 19 |  |  | -5 |  |  |  |

b) On the grid provided,draw the graph of y=x3 + 5x2 5x5 for -5 ≤ ×≤ 2. Using a scale of 1cm to represent 1 unit in the horizontal axis and 1cm to represent 5 units vertically. (3mks)

c)Use the graph to solve the equation x3 + 4x2 – 5x – 5 =0 (2mks)

ii)By drawing a suitable line graph, solve the equation x3 + 4x2 – 5x – 5 = -4x.- 1 (3mks)

20) In the figure below, PQR is a tangent to the circle at Q. TS is a diameter and TSR and QUV are straight lines. QS is parallel to TV. <SQR = 40º And < TQV =55º

a)Find the angles below giving reasons for each answer.

i)QTS (2mks)

ii)QRS(2mks)

iii)QVT(2mks)

iv)UTV(2mks)

v)USQ(2mks)

21.In the diagram below OPQ in such that QN : NP = 1:2, OT:TN =3:2, and M is the mid point of OQ

a)Given that OP = p and OQ = q. Express the following vectors in terms of p and q

i)PQ

ii)ON

iii)PT

iv)PM

b) i) Show that point P,T and M are collinear (3mks)

ii) Determine the ratio MT:TP (1km)

22.The first term of an AP is 2. The sum of the first 8 terms is 156

i)Find the common difference of the AP (2mks)

ii)Given that the sum of the first n in terms of the AP. is 416. Find n. (2mks)

b)The 3rd , 5th and 8th terms of another AP correspond to the first three consecutive terms of a GP . If the common difference of the AP in 3, find

i) The first term of the AP (3mks)

ii)The sum of the first 8 term of the GP to 4 significant figures (3mks)

23)Three variables P, Q and R are such that P various directly as Q and inverserly as the square of R

a)When P = 9, Q=12 and R=2 Find P when Q = 15 and R=5 (4mks)

b)Express Q in terms of P and R (1mk)

c)If P is increased by 20% and R reduced by 10%, find

i)a simplified expression for the change in Q in terms of P and R (3mks)

ii)The percentage charge in Q (2mks)

24. OABC is a parallelogram with verities 0(0,0), A(2,0) B(3,2) and C(1,2). O,A,B,C is the image of OABC under transformation matrix.

a) Find the coordinates of O1A1B1C1 (2mks)

ii)On the grid provided, draw OABC and O1A1B1C1 (2mks)

b) Find O11A11B11C11, the image of O1A1B1C1 under transformation matrix (2mks)

ii) On the same grid draw O11A11B11C 11  (1mk)

c) Find a single matrix that maps O11A11B11C11 onto OABC (3mks)