Name………………………………………………………………………………………………………

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GATITU DAY MIXED SECONDARY SCHOOL

MATHEMATICS PP 1 FORM IV

TRIAL 2 MOCK EXAM

TIME: 2 ½ HRS

**Instructions**:

Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.

PAPER ONE

SECTION A

1. Without using a calculator evaluate leaving your answer as a mixed fraction (3mks)

-5(-23 + 41) – (-10)

-3 + (-8)/ 2 \* 4

1. Solve the simultaneous equations (3mks)

2x –y =3

X2 –xy=-4

1. Find the least number of steps in a staircase if one goes up two steps at a time, three steps at a time or four steps at a time, there is always one step remaining at the top. (3mks)
2. A metal cube of sides 4.4 cm was melted and the molten material was used to make sphere. Find the radius of the sphere (take II =22/7) (3mks)
3. Use reciprocal, square root tables to evaluate to 4 significant figures the expression, showing the steps in your working (3mks)

1 +4.362

24.56

6. Without using mathematical tables, find given that:

Sin (2 - 10) = cos 6 oo< < 900 (**2mks)**

**7**. Ann bought 24 trays of eggs at sh. 225 each. Each tray contains 30 eggs. 54 eggs broke during transportation. At what price must she sell each egg in order to make a profit of 22%? (Giving your answer to the nearest one shilling) (4mks)

8. Solve for x in the equation (3mks)

125x \* 5 2 (x-2) = 25 (x-2)

9. John and James working together can do a piece of work in 2 2/5 days. John working alone takes 2 days less than James to complete the work. Calculate how long it takes James to complete the work alone. (4mks)

10. Given that the lines whose equations are 4ax =5y +12 and 7bx – 3y =2 are parallel. Find the values of a and b. (3mks)

11. A translation maps a point P (1, 2) onto P (-2, 2). Point R is mapped onto R (-3, 3) under the same translation. Find the length of PR. (3mks)

12. Nairobi and Mtito Andei are 240 km apart. A bus left Nairobi at 9 am and traveled towards Mtito Andei at 80 km /h, 45 minutes later, a car left Mtito Andei for Nairobi at a speed of 100 km/h. Calculate the distance covered by the bus before meeting the car. (3mks)

13. Solve the inequalities, 4x -3< 6x – 1 < 3x +16 and state all the integral values that satisfy the inequalities. (3mks)

14. The depths of two similar buckets are 28 cm and 21 cm respectively. If the larger bucket holds 3.1 litres, find the capacity of the smaller bucket (3mks)

15. Simplify the expression: (3mks)

49x2 – 9y2

14x + 7xy + 6y +3y2

16. Ashear with x –axis invariant maps point P (4, 3) onto P (10, 3). Determine the shear matrix hence the image of a Q (1, -2) under the shear. (3mks)

**SECTION B (50MKS)**

**Answer any five questions in the spaces provided**

17. A trade sold an article at sh. 4800 after allowing his customer a 12% discount on the marked price of the article. In so doing, he made a profit of 45%.

a.) Calculate,

i.) The marked price of the article (2mks)

ii.) The price at which the trader had bought the article (3mks)

b.) If the trader had sold the article without giving a discount. Calculate the percentage profit he would have made. (2mks)

c.) To clear his stock, the trader decided to sell the remaining articles at a loss of 12.5%. Calculate the price at which he sold each article. (3mks)

18. A quadrilateral has vertices at A (3, 7), B (5, 5), C (3, 1) and D (1, 5)

a.) On the grid provided, plot ABCD. (1mk)

b.) ABCD is the image of ABCD under a translation **T** (-6). Plot A B C D and state its coordinates.

(-9) (3mks)

c. ) Plot A B C D , the image of A B C D after a rotation about (-1, 0) though a positive quarter turn. State its coordinates. (3mks)

d. ) A ‘’ B’’ C’’ D’’, is the image of A’ B’ C’ D’ after a reflection in the line y = x + 2. Plot A ‘’B ‘’ C’’ D’’ and state its coordinates. (4mks)

19. The diagram below represents a solid frustum with base radius 21cm and the top radius 14cm. The frustum is 22.5cm high and is made of a metal whose density is 3g/cm3 (take II = 22/7)

14cm

22.5cm

21cm

a.) Calculate

i.) The volume of the frustum (4mks)

ii.) The mass of the frustum in kg (2mks)

b.) The frustum is melted down and recast into a solid cube. In the process 20% of the metal is lost. Calculate to two decimal places the length of each side of the cube (4mks)

20. a.) Complete the table of values for the function y =2x2 – 3x – 5 for integral values of x in the range -s2< x < 3 (2mks)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| X | -2 | -1 | 0 | 1 | 2 | 3 |
| Y |  |  |  |  |  |  |

b. ) Plot the graph of y =2x2 -3x -5 for -2 < x <3 using the scale 1cm represents 2units on the vertical axis and represents 1 unit on the horizontal axis. (3mks)

c.) Use your graph to solve the equation 2x2 -3x -5 = 0 (1mk)

d. ) By drawing suitable straight lines on the same axis, solve the equations:

i.) 2x2 -3x -8 = 0 (2mks)

ii.) 4x2 – 2x – 6 = 0 (2mks)

21. In the figure below, PQR is the tangent to the circle at Q TS is a diameter and TSR and QUV are straight lines. QS is parallel to TV. Angle SQR = 400 and angle TQV =550

V R

U S

T 555 Q

Find the following angles giving reasons for each answer,

a.) QTS (2Mks)

b.) QRS (2mks)

c.) QVT (2mks)

d.) UTV (2mks)

e.) TQS (2mks)

22. a.) Divide 100 cm3 in the ratio 1/4: 1/2: 1/5 to the nearest whole number (2mks)

b.) In a chemistry experiment, a boy mixed some acid solution of 45% concentration with an acid solution of 25% concentration. In what proportion should the two acids be mixed in order to get a solution of 30% concentration? (3mks)

c.) i.) Two blends of tea costing sh. 140 and sh. 160 per kg respectively are mixed in the proportion of 2:3 by mass. The mixture is then sold at sh. 240 per kg. Find the percentage profit. (3mks)

ii.) In what ratio should the two blends be mixed to get a mixture that costs sh. 148 per kg? (2mks)

23. In the diagram below OABC is a parallelogram, OA= a and AB= b. N is a point on OA such that ON: NA =1:2.

B

C

b

A

N a O

a.) Find:

i. AC in terms of a and b (1mk)

ii. BN in terms of a and b (2mks)

b.) The lines AC and BN intersect at x, AX =h AC and BX = k BN. Determine the value of h and k (5mks)

c.) State the ratio:

i. BX: XN (1mk)

ii. AX: XC (1mk)

24. The table below shows the distribution of marks scored in a test by standard 8 pupils in a school.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Marks | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 | 65-69 | 70-74 | 75-79 |
| No. of pupils | 1 | 5 | 10 | 10 | 19 | 20 | 20 | 8 | 4 | 3 |

a.) Calculate the median mark (3mks)

b. ) i. Using 57 as the assumed mean mark. Calculate the actual mean (3mks)

ii. The standard deviation of the marks (4mks)