NAME:…………………………………….ADMNO…………………………..CLASS……

MATHEMATICS

FORM 4 TERM 2 2021

PAPER 1

2 ½ H0URS FORM FOUR END OF TERM TWO EXAM -2021

INSTRUCTIONS TO CANDIDATES

1. Write your name, index number and class.

2. The paper contains two sections: Section I and II

3. Answer ALL questions in section I and ONLY FIVE questions from section II.

4. All working 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 16 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 1

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

**GRAND TOTAL**

SECTION II

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

121/1

Mathematics

Paper1

1

1. Without using a calculator, evaluate (3mks)

1. A number n is such that when it is divided by 3,7,11 or 13, the remainder is always one. Find the number n (2mks)
2. Solve the inequality 3-2x and show the solution on the number line (3mks)

2

1. In the figure below AB is parallel to DE and area of triangle DEC is 8cm2.

B

E

10cm 4cm

A x cm D 6cm C

Find

1. The value of x (2mks)
2. The area of quadrilateral ABED (2mks)
3. A bank in Kenya buys and sells foreign currencies as follows;

|  |  |  |
| --- | --- | --- |
| Currency | Buying(Ksh) | Selling (Ksh) |
| 1 sterling Pound  1 US dollar | 132.40  70.40 | 132.75  70.84 |

A tourist arrived in Kenya with US dollar 3500. He converted all the dollars to Kenya shillings at the bank. While in Kenya, he spent Ksh115,000 and then converted the remaining amount to sterling Pounds. Calculate the amount he received in Sterling pounds (3mks)

3

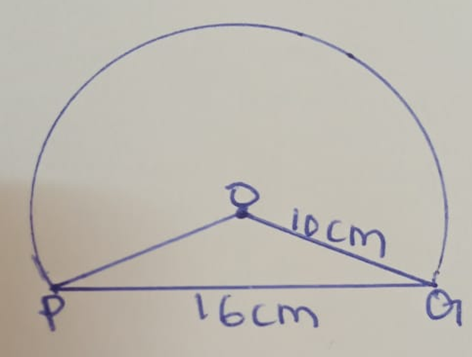
1. Solve for x given that; (2mks)

Cos(2x – 40) = sin (-20 +3x)

1. The size of an interior angle of a regular polygon is 3x while its exterior angle is (x-20). Find the number of sides of the polygon. (3mks)
2. Log 5 -2 +log (2x+10) = log (x-4) (3 mks)
3. Find the equation of the perpendicular bisector of a straight line passing through the points P(2,7) and Q(4,3) giving your answer in the form ax +by +c =0 (4mks)

4

1. The figure below shows a sector of a circle with centre O, radius 10cm. The chord PQ=16cm Calculate the area of the sector PXQ (4mks)

 X

1. Simplify the expression (3mks)

1. Use the reciprocal tables to evaluate (3mks)

5

1. The volumes of two similar solid cylinders are 4752cm3 and 1408cm3. If the area of the curved surface of the smaller cylinder is 352cm2, find the area of the curved surface of the larger cylinder (4mks)
2. A bus takes 195 minutes to travel a distance of (2x +30) km at an average speed of (x-20)km/h. Calculate the actual distance travelled. Give your answer in kilometres (3mks)
3. Given that OA =3i -2j and OB=4i+j. Find the distance between points A and B correct to 1 decimal place (2mks)

6

1. Murimi and Naliaka had each 288 tree seedlings.Murimi planted equal number of seedlings per row in x rows while Naliaka planted equal number of seedlings in (x+1) rows. The number of tree seedlings planted by Murimi in each row were 4 more than those planted by Naliaka in each row. Calculate the number of seedling Murimi planted in each row. (4 mks)

7

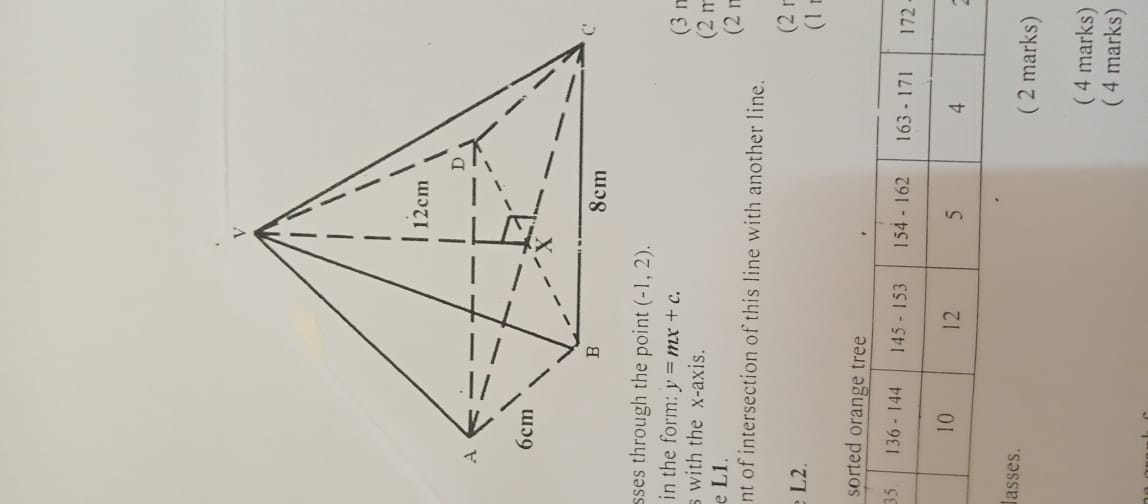
**SECTION II.(ANSWER FIVE QUESTIONS ONLY**

1. Two business partners Mary and John contributed Ksh.60000 and Ksh90000 respectively to start up a business. After 6 months, Lucy joined the business partnership and contributed Ksh.100000. At the end of the year, a gross profit of Ksh.720000 was realized. They then agreed to re-invest 30% of the profit accrued back into the business and use 20% of the profit for running the business operations. The remainder was to be shared among the business partners in the ratio of their contribution.
2. Calculate the amount;
3. Re-invested into the business (2mks)
4. Used for business operations (1mk)
5. Calculate the amount of profit each partner got (4mks)
6. If the amount put back into the business was added to individual’s shares proportional to their initial contribution, find the amount of each partner’s shares (3mks)

8

1. A bus left Nairobi at 7.00a.m and travelled towards Eldoret at an average speed of 80km/h. At 7.45a.m a car left Eldoret towards Nairobi at an average speed of 120km/h. Given that the distance between Nairobi and Eldoret is 300km. Calculate;
2. The time the bus arrived at Eldoret (2mks)
3. The time of the day, the two met (3mks)
4. The distance from Nairobi where the two met (2mks)
5. The distance of the bus from Eldoret when the car arrived in Nairobi (3 mks)

9

1. The figure below shows a solid which is a rectangular based pyramid of height 12cm.
2. Calculate the slanting length VC (2mks)
3. Calculate the surface area of the pyramid (4mks)
4. Calculate the volume of the pyramid (2mks)
5. Determine the density of the metal which make this solid if its mass is 1.632kg (2mks)

10

1. In the figure below OJKL is a parallelogram in which OJ = 3 and OL = 2

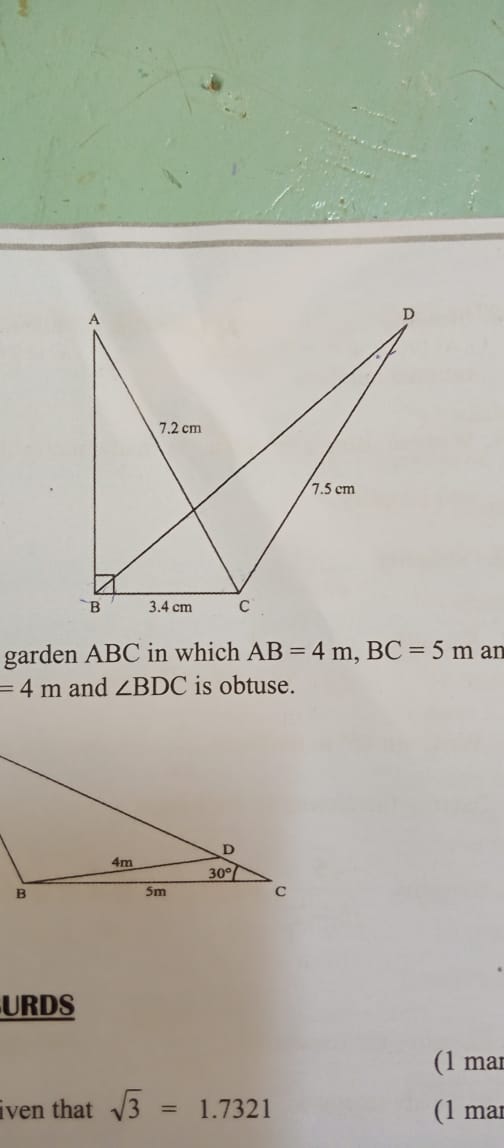
L K

2r

O 3p J

1. If A is a point on LK such that LA = ½ AK and point B divide the line JK externally in the ratio 3:1, express **OB** and **AJ** in terms of **p** and **r.** (2 marks
2. Line OB interests AJ at X such that **OX** = m**OB** and **AX** = n**AJ.**
3. Express OX in terms of p, r and m. (1 mark)
4. Express OX in terms of p, r and n (1 mark)
5. Determine the value of *m* and *n* and hence the ratio in which point x divides line AJ. (6 marks)

11

1. The figure below shows two triangles, ABC and BCD with a common base BC=3.4cm, AC=7.2cm, CD=7.5cm and <ABC=90. The area of triangle ABC=Area of triangle BCD.

Calculate correct to one decimal place;

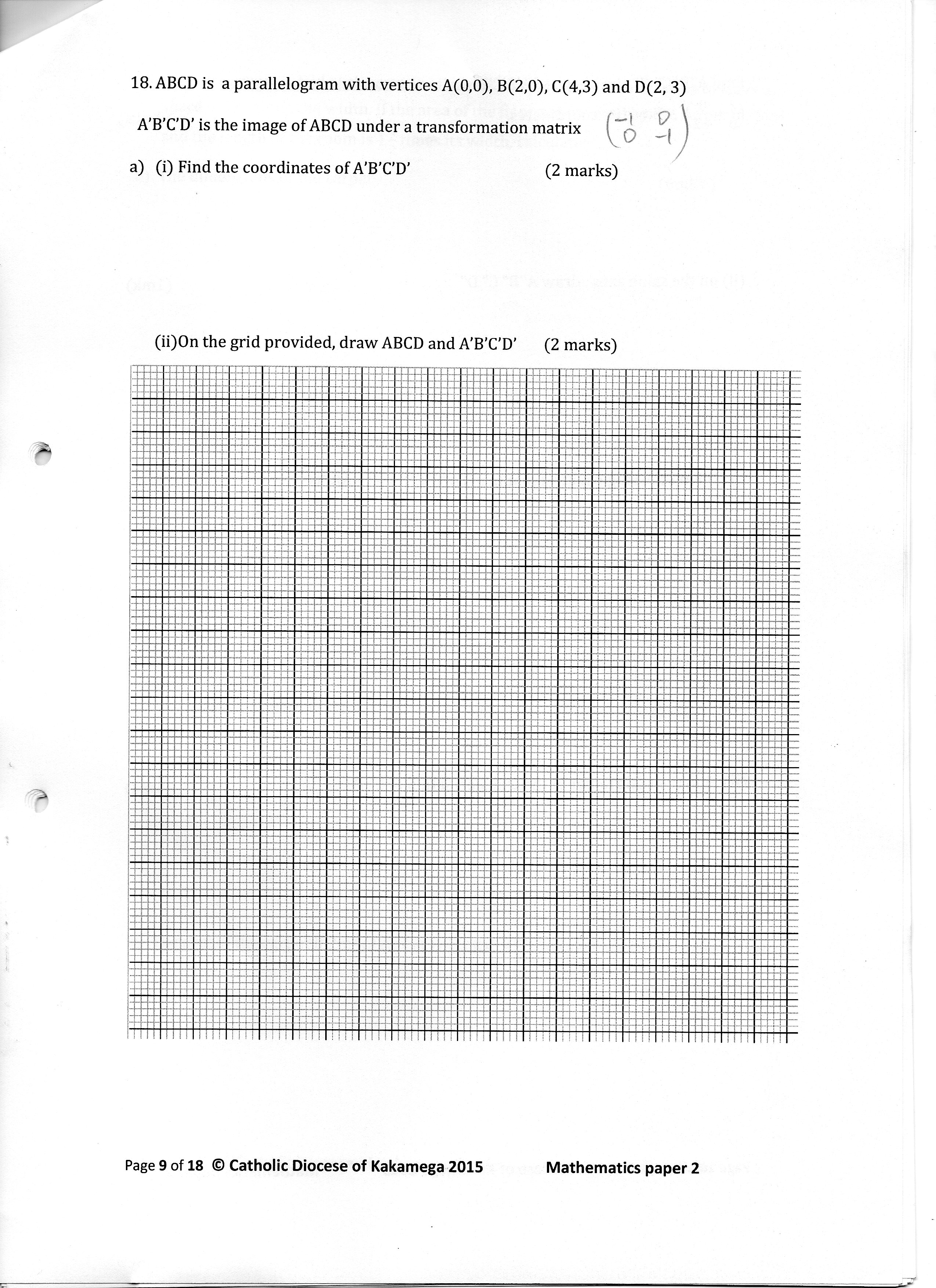
1. The area of triangle ABC (3mks)
2. The size of <BCD (3mks)
3. The length of BD (2mks)
4. The size of <BDC (2mks)

12

1. The equation of a curve is y=x3+4x2 -3.
2. Fill in the table below for the curve y=x3+4x2 – 3 (2mks)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| x | -4 | -3 | -2 | -1 | 0 | 1 |
| y |  |  |  |  |  |  |

1. On the grid provided, draw the curve y=x3+4x2 -3 for the range -4 scale: Horizontal axis 2cm represent 1 unit vertical axis 1cm rep 1 unit (3mks)



1. Use your graph to solve
2. x3 +4x2 – 3 = 0 (2mks)

1. 4x3 +16x2 –x – 16 = 0 (3mks)

14

1. (a) A straight line L1 whose equation is y-2x=4 meets the x-axis at M. Determine co-ordinates of M. (1mk)

(b) A second line L2 is perpendicular to L1 at M. Find the equation of Line L2 in the form ax+by+c=0 where a,b and c are integers. (3mks)

(c) A third line L3 passes through (2,3) and is parallel to L1. Find;

1. The equation of L3 in the form y=mx +c (3mks)
2. Point N, the intersection of L2 and L3 (3mks)

15

1. A curve is represented by the function y=x3 +x2 – x
2. Find (1mk)
3. Determine the values of y at the turning points of the curve y =x3 +x2 –x (4mks)
4. Determine the nature of the turning points (2mks)
5. In the space provided below, sketch the curve of y=x3+x2 –x (3mks)

16