

FORM 3 MATHEMATICS
MAKE UP CAT TERM 1 2016
TIME: 2½ HOURS

<i>Date done</i>	
<i>Invigilator</i>	
<i>Date returned</i>	
<i>Date revised</i>	

INSTRUCTIONS

- Write your name, stream and class number in the spaces provided at the top of this page.
- The paper contains two sections i.e. **I** and **II**.
- Answer **ALL** the questions in Section I and only **FIVE** from section **II**.
- All answers and working must be written on the question paper in the spaces provided below each question.
- Marks may be awarded for correct workings even if the answer is wrong.
 - You may use electronic calculators and/or KNEC mathematical tables **UNLESS** stated otherwise.

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	22	23	24	TOTAL

GRAND TOTAL

j

SECTION A (50 MARKS)

1. Evaluate; $\frac{0.02 - 0.65 \div 2.5}{4.8 + 0.25 \times 0.6}$ 3marks

2. Use tables to evaluate $\sqrt[3]{\frac{2.345 \times 0.567}{0.692}}$ 4marks

3. i). The mean of the numbers n , $8n + 1$, 17 and 20 is 14. Calculate the value of n 2marks

- ii). The mode 1marks

4. Solve the equation $x^2 = 4\left(\frac{1}{2}x + 2\right)$

4marks

5. Given that $\frac{2\sqrt{3}}{1+\sqrt{3}} - \frac{\sqrt{3}}{1-\sqrt{3}} = a + b\sqrt{c}$ Find the values of a , b and c

3marks

6. An exterior angle of a regular polygon is equals to a fifth of interior angle .find the number of sides of a polygon.

3marks

7. Find the smallest number that should be added to 3462 to get a number divisible by 11

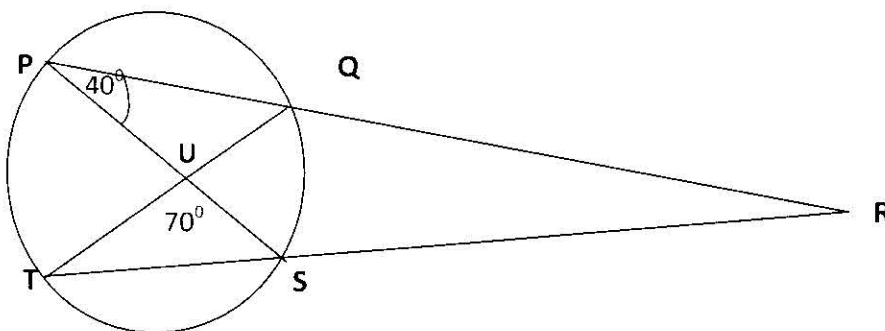
2marks

8. The dimensions of a rectangle in centimeters are $2n - 3$ by $n + 1$ and the area is 817cm^2 . Determine the length of the diagonal

3marks

9. In the figure below, $\angle SPQ = 40^\circ$ and $\angle TUS = 70^\circ$. Calculate $\angle PRT$

3marks



10. Express the following recurring decimals numbers as fraction $0.56\dot{7}\dot{1}$.

3marks

11. Five men each working 10 hours a day take two days to cultivate one acre of land .How long will two men each working six hours a day, take to cultivate three acres of land?

3marks

12. Find the value of y in the equation $8^{y+2} + 2^{3y} = 32^{\frac{1}{2}}$

3marks

13. Three children shared some money. John got 0.7 of the money and Jane got 0.4 of the remainder. Mary received the rest which was Sh.405. How much did Jane get? 4marks

14. Given that $\cos A = \frac{5}{13}$ is acute angle, find $\tan A$ without using tables or calculators. 2marks

15. Using a ruler and a pair of compasses only, construct triangle ABC such that $AB=4.5$ cm , $BC=8.1$ cm and angle $CBA=60^{\circ}$. Measure angle CAB

4marks

16. Simplify as far as possible

$$\frac{x-3}{x+3} - \frac{4x-12}{x^2-9}$$

3marks

SECTION B (answer only five question)

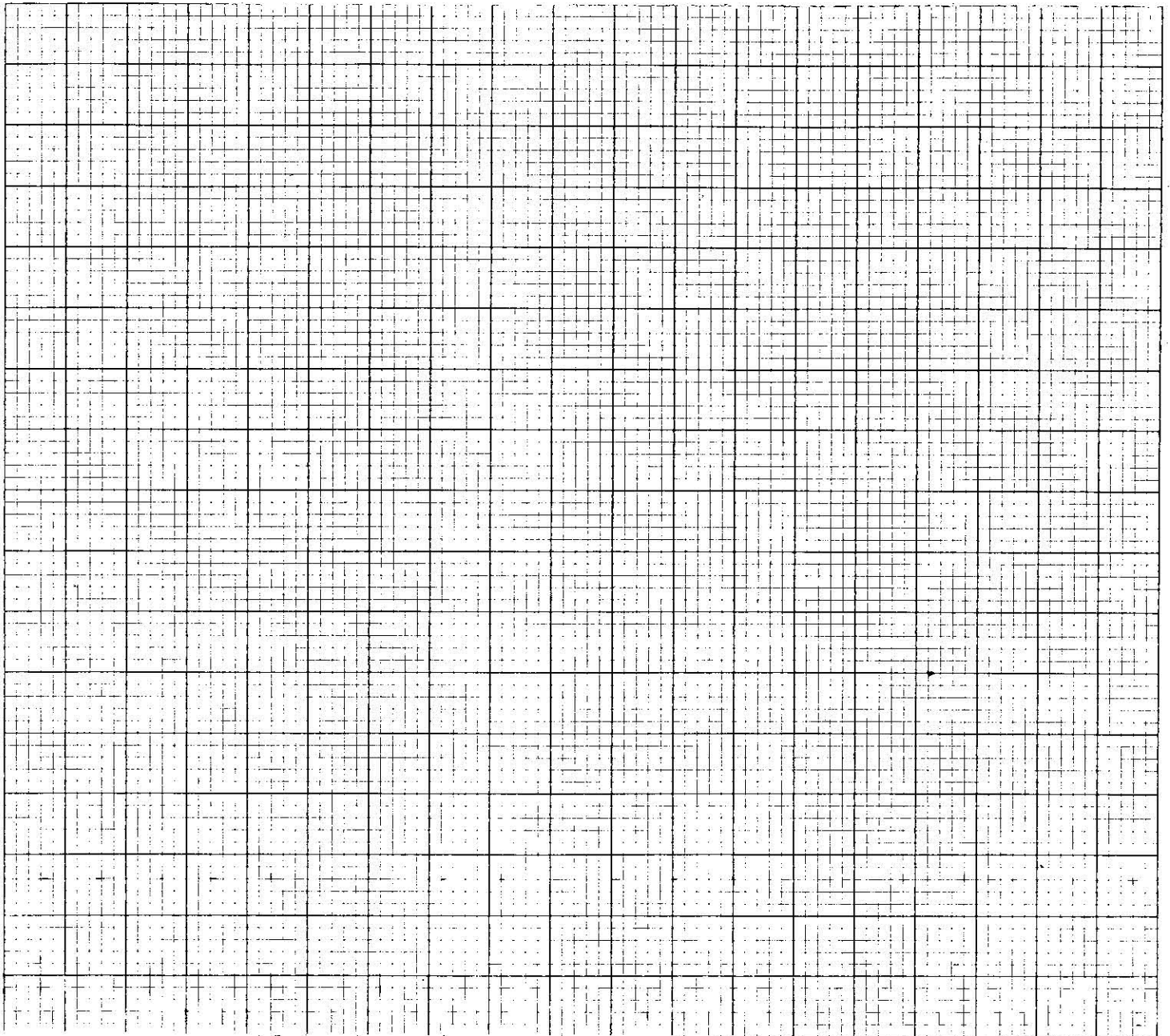
17. Draw the quadrilateral with vertices A(-6,-1) B(-6,-4) C(3,-7) and D(3,2) on the grid below.

(a) On the same grid draw the image of ABCD under enlargement centre (0,-1) scale factor $\frac{1}{3}$. Label the image A'B'C'D' 3marks

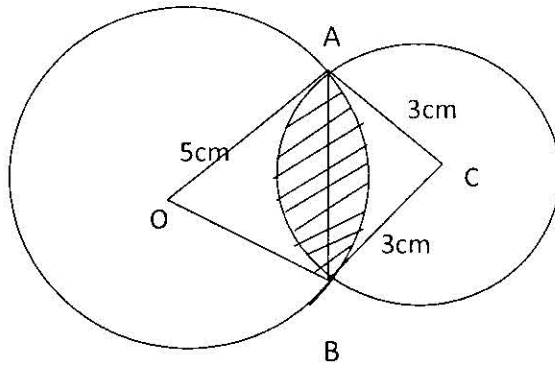
(b) Draw A''B''C''D'' the image of A'B'C'D' under rotation of $+90^\circ$ about (1,0) 2marks

(c) Draw A'''B'''C'''D''' the image of A''B''C''D'' under a reflection in the line $y=x=0$ 2marks

(d) Draw A''''B''''C''''D'''' the image of A'''B'''C'''D''' under translation (2,3) and write the co-ordinates of the final image 3marks



18. In the figure $OA=5\text{cm}$, $AC=3\text{cm}$ and $AB=4.4\text{cm}$. O and C are centres of the two circles



(a) calculate i). angle AOB

2mark

ii). angle ACB

2mark

(b), The area of:- i) sector OAB

1mark

ii) sector CAB

1mark

(c) The area of:-

i) Triangle OAB

1 mark

ii) triangle CAB

1mark

(d) The area of the shaded region

2marks

19. Three jets M, N and P are coming to airport A which is on a bearing of 340 from an adjacent airport B. N is east of airport A and 600 km from airport B, on a bearing of 040° . M is on a bearing of 045° from A. P and M are due north of B. P is on a bearing of 250° from N.

(a) By scale drawing show the positions of M, N, P, A and B. (use the scale of 1cm to represent 100 km)

5marks

(b) Determine the bearing of

i) N from M

1mark

ii) P from A

1mark

(c) Find the distance between

i) M and N

1mark

ii) B and P

1mark

iii) A and M

1mark

20. A group of people planned to contribute equally towards a water project which needed Ksh. 2,000,000 to complete. However 40 members of the group withdrew from the project. As a result each of the remaining members were to contribute Ksh.2500 more.
- (a) Find the original number of the group 5marks

- (b) Forty five percent of the value of the project was funded by the constituency development fund (C.D.F) Calculate the amount of contribution that would be made by each of the remaining members. 3marks

- (c) Members contributions were in terms of labour provided and money contributed. If the ratio of the value of labour to the money contributed was 6:9. Calculate the total amount of money contributed by members. 2marks

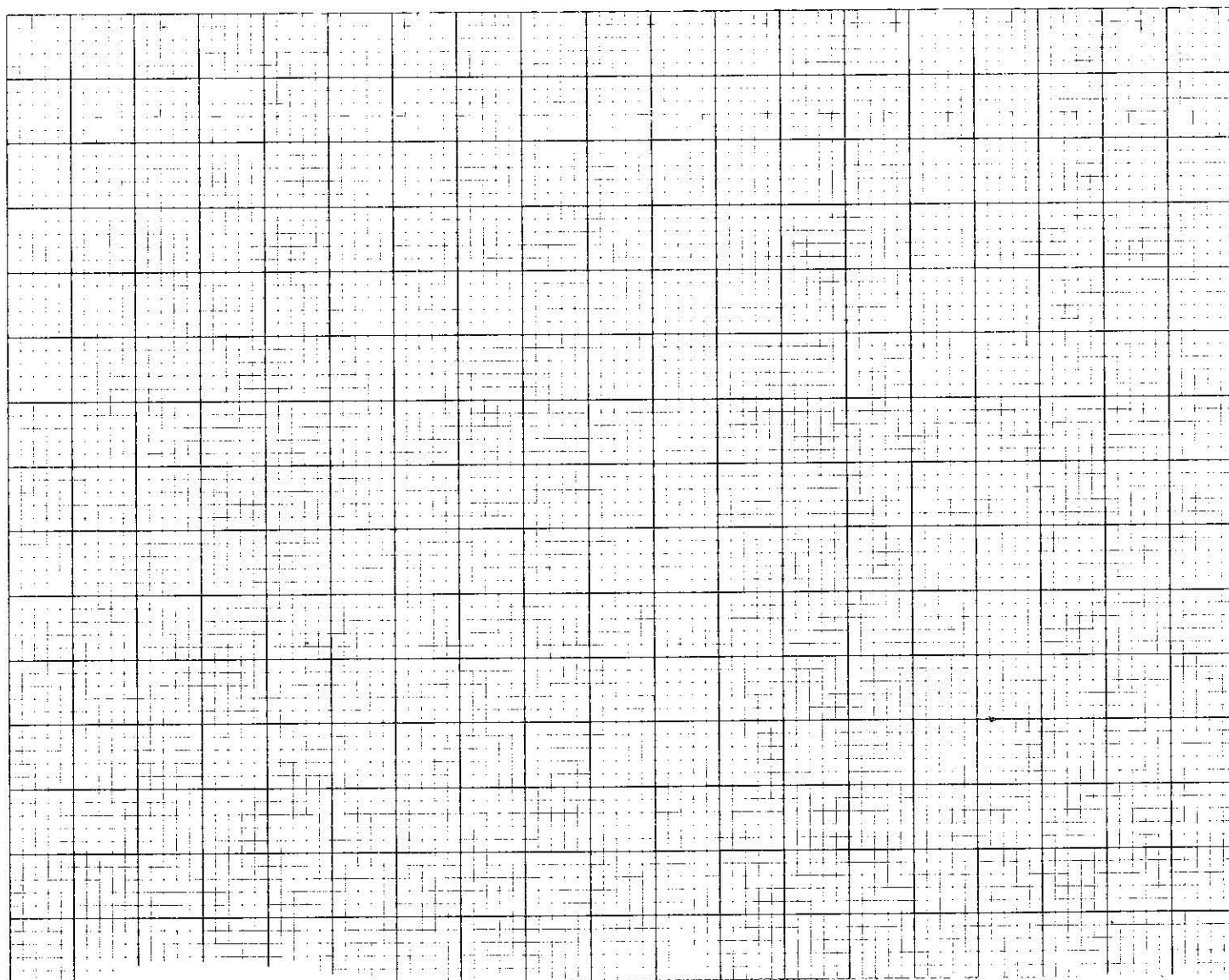
21. (a) Complete the table below for the function $y = 2x^2 + 4x - 3$

x	-4	-3	-2	-1	0	1	2
$2x^2$	32		8	2	0	2	
$4x$			-8		0		8
-3	-3	-3	-3	-3	-3	-3	-3
y			-3		-3		

2marks

(b) On the grid provided, draw the graph of the function $y = 2x^2 + 4x - 3$ for $-4 \leq x \leq 2$ and use the graph to estimate the roots of the equation $2x^2 + 4x - 3 = 0$ to 2 d.p.

5 marks



(c) use the graph to solve the equation $2x^2 + x - 5 = 0$

3marks

22. A bus left kisumu at 9.30 a.m towards Nairobi at an average speed of 81km/h. A matatu left Nairobi at 10.10 a.m towards kisumu at an average speed of 72 km/h. The distance between kisumu and Nairobi is 360 km.

(a) Determine

1)the time taken before the vehicles met

3marks

2)The distance between the two vehicles 40 minutes after meeting

2marks

(b)A car left kisumu towards Nairobi at 9.50 a.m at an average speed of 90 km/h. Determine

1)The time when the car caught up with the bus

3marks

2)The distance of Nairobi from the place where the car caught up with the bus

2marks

23. A school starts lessons at 8.00 a.m and has 9 lessons of 40 minutes each day. There 's a 10 minutes break after the second period, a 20 minutes break after the 4th period and 1 ¼ hour lunch break after the 6th period.

(a)At what time does the 5th period start?

3marks

(b)At what time does the lunch break end?

4marks

(c)How long is it from the beginning of the first period to the end of the last period?

3marks