CANDIDATE NAME ……..

CHINSAPO CLUSTER EXAMINATION

2022 MALAWI SCHOOL CERTIFICATION OF EDUCATION

MATHEMATICS

Date__/___/2022

Subject Number M131/I
Time allowed 2Hrs
8:00am - 10.30 am

PAPER I

(100 marks)

INSTRUCTIONS.

1. This paper contains 12 **pages.** Please check.
2. Answer all the twenty questions
3. Write **your name** on top of **each page** used as answer sheet
4. The maximum number of marks for each question is indicated against each question
5. Calculators may be used
6. Candidate will be penalized for cheating
7. In the box provided on this page, tick against the question number you have answered.

Question number	Tick if answered	Do not write in these column	
1			
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Total			

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1. (a) Factorise completely; $5 - 9x - 2x^2$. (3 marks)

(b) Simplify $\sqrt{18p^3q^3} - p\sqrt{8pq^3}$. (4 marks)

2. Find the remainder when $8x^3 - 6x^2 + 5x - 1$ is divided by $2x - 1$. (4 marks)

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3. A machine costs K699 000 with 16.5% VAT inclusive. Calculate the cost of the machine before the VAT was added. (4 marks)

4. Make q the subject of the formula $t = \frac{p(q-r)}{4qr}$ (4 marks)

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5. **Figure 1** below shows a circle with centre O, DC is a tangent to the circle at C, angle BAO = 28˚ and angle ACD = 44˚

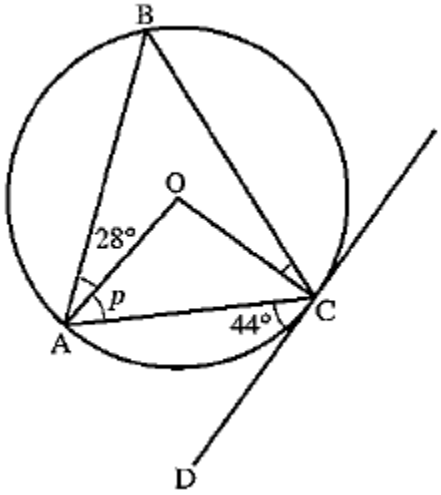

Figure 1

Calculate the value of the angle marked *p*. (4 marks)

6. Given that *x* varies inversely as the square of *y* and *x* = 4 when $y = \frac{1}{2}$, find *y* when *x* = 5. (5 marks)

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7. Given that $\log_x 1024 - \log_x 128 + \log_x 16 = 7$, calculate the value of x. (5 marks)

8. Calculate the standard deviation of the following set of numbers, 75, 80, 70, 80, 80.
(5 marks)

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9. Given that A = $\begin{pmatrix} 2 & 5 \\ 3 & 1 \end{pmatrix}$, B = $\begin{pmatrix} x & 0 \\ 4 & -3 \end{pmatrix}$ and AB = $\begin{pmatrix} 18 & -15 \\ 1 & -3 \end{pmatrix}$, calculate the value of *x*.

(5 marks)

10. In a group of 30 girls, 19 play volleyball (V), 17 play handball (H) and 10 play both. Given that 3 of the 10 play basketball (B), 5 play handball and basketball, and 9 play volleyball and basketball, use a Venn diagram to find the number of girls who play basketball only. (6 marks)

11. Simplify $\frac{a^2+a}{2a^2+a-1} \div \frac{a}{2}$. (4 marks)

12. **(a)** **Figure 2** below shows a speed-time graph of a bus.

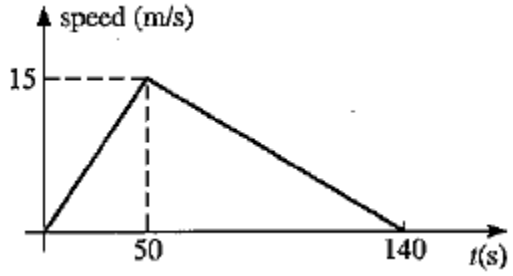

Figure 2

Calculate the distance travelled by the bus from the start of deceleration to time of stopping.

(3 marks)

(b) Given that g(y) = $\frac{1-2y}{3-y}$, evaluate g(- $\frac{1}{2}$). (3 marks)

13. Given $\underline{a} = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$ and $\underline{b} = \begin{pmatrix} 5 \\ -1 \end{pmatrix}$, find $|3\underline{a} - 2\underline{b}|$, giving your answer correct to two decimal places. (6 marks)

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14. Two similar cylindrical tins have base radii of 6 cm and 8 cm respectively. If the volume of the larger tin is 252 cm^3, calculate the volume of the small tin. (4 marks)

15. The 7^{th} and 15^{th} terms of an arithmetic progression are 28 and -12 respectively. Calculate the 50^{th} term of the progression. (6 marks)

16. In a parallelogram PQRS, PQ = 20 cm, QR = 12 cm and the area of the parallelogram is 60 cm². Calculate the value of angle PQR given that it is acute. (5 marks)

17. A milling company mixes 20 kg of grade A rice with *y* kg of grade B rice. Grade A rice costs K700 per kg and grade B rice costs K600 per kg. If the mixture costs K640 per kg, calculate the value of *y*. (6 marks)

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18. Find the coordinates of the turning point on the graph whose equation is $y = x^2 - 4x + 1$.

(4 marks)

19. Using a ruler and a pair of compasses only, construct an inscribed circle of a triangle RST such that RS = 7 cm, ST = 9 cm and TR = 6 cm. Measure and state the radius of the circle. (5 marks)

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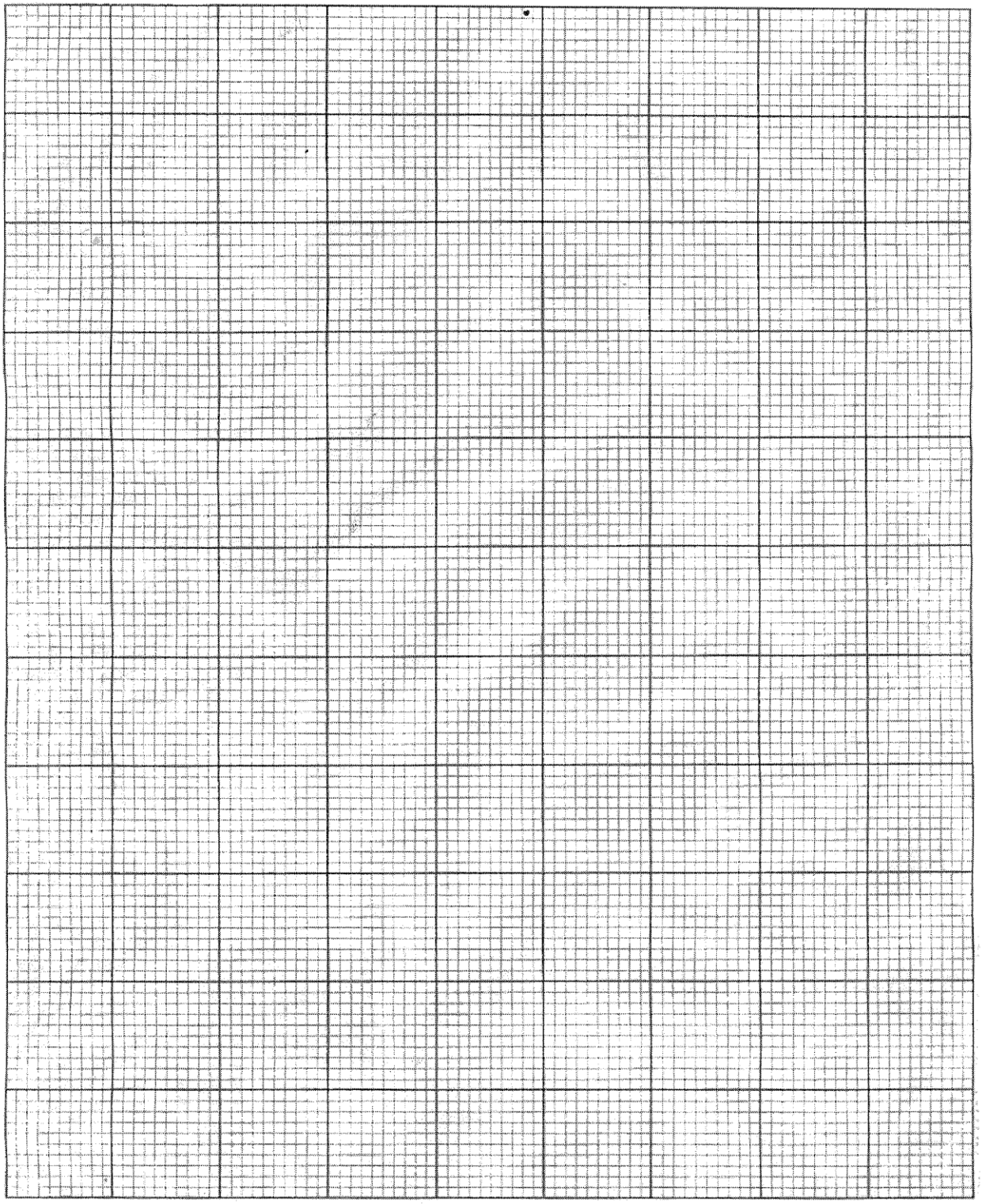
20. On the same axes using a scale of 2 cm to represent 1 unit, draw the graphs to show the region **R** bounded by the following inequalities by shading the unwanted region: $x \geq 0$, $y < 4$, $3x + 4y \geq 12$ and $2x - y < 5$. (6 marks)



END OF QUESTION PAPER