# **CHIPASULA SECONDARY SCHOOL**

### **2022 MSCE END TERM ONE EXAMINATION**

## **MATHEMATICS**

Subject Number: M131/I



Time Allowed: 2 hours8:00 - 10:00 am

PAPER I (100 marks)

#### Instructions

- 1. This paper contains 10 pages. Please check
- 2. Before beginning, fill in your Name at the top of each page of the question paper
- 3. Answer all the 20 questions in the spaces provided.
- **4.** Use of electronic calculators is allowed.
- 5. The maximum number of marks for each question is indicated against each question
- 6. In the table provided on this page, tick against the question number you have answered.

Question	Tick if	Do not write in
Number	answered	these columns
1		
2		
3		
4		
5		
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8		
9		
10		
11		
12		
13		
14		
15		

**1**. Factorize  $2x^2 - 7x - 4$  completely.

(3 marks)

**2**. Points A and B are (a,-4) and (-3, b) respectively. If the mid-point of AB is (-2, 3), find the values of *a* and *b*.

(5 marks)

**3.** Find the remainder when  $a_3 + 2a_2 - 3$  (a-3) is divided by a+1

4. Without using a table of a calculator simplify

$$\frac{1}{\sqrt{3}} - \frac{\sqrt{3}}{3} \tag{5 marks}$$

**5.** Subtract 
$$1264_{8}$$
 from  $30155_{6}$  and leave your answer in base 10

(4 marks)

6. A rhombus has one side of the diagonal 24cm long and a side 13cm.What is the length of the other diagonal?

**7**. Solve the equation  $2x^2 - 3x - 4 = 0$ , leaving your answer Correct to two decimal places

(7 marks)

8. P varies as q and the square of r. when p = 36, q = 2 and r = 3. Express q in terms of p when  $r = \frac{1}{2}$ 

(7 marks)

**9.** In what proportion must two grades of tea costing K120 per kg and K150 per kg be mixed in order to produce a blend worth K125 per kg?

(3 Marks)

**10**. Given that 
$$f(t) = \frac{t+3}{2t+1}$$
 find  $f(-8)$ 

(5 Marks)

11. Change 1267 to a base 4 (5 Marks)

12. Make *r* the subject of the formula  $p = \frac{r}{1+r}$ (5 Marks)

13. Zodwe bought a radio at K52 000.00. During its first year in use it depreciated by 10% of its value. During the second year, it depreciated by 15%. Calculate the value of the radio after two years

(5 Marks)

14. Without using a calculator, simplify  $\sqrt{243} - \sqrt{3} + \sqrt{27}$  (3 Marks)

15. Given that the interior angle of a regular polygon is 135°, calculate the number of sides of a polygon (5 Marks)

16. Using a pair of compasses and a ruler only, construct a triangle
PQR such that QR = 5cm, PR = 6 cm and PQ = 7 cm. In the same diagram, draw a circumscribed circle to the triangle PQR (5 Marks)

**17.**Given that matrix  $M = \begin{bmatrix} 3 & 5 \\ -1 & 1 \end{bmatrix}$  and  $N = \begin{bmatrix} -1 & 1 \\ 0 & 2 \end{bmatrix}$ . Find MN - M. (5 Marks)

18. Figure 1 shows unshaded region R on a Cartesian plane.







**19.** A quantity *Q* is directly proportional to *x* and the square of *y*. When y = 30, x = 50 and Q = 900. Calculate the value of *Q* when x = 20 and y = 100.

(5 Marks)

20. Figure 2 shows a closed cylinder with diameter 14 cm and



height 40 cm.

Figure 2

Calculate the total surface area of the cylinder (take  $\pi = \frac{22}{7}$ ). (4 Marks)

THE END OF QUIATION PAPER





## THE TEACHER OF THE MOMENT SIR GODFREY MALATA

MANY THANKS TO THOSE WHO PAID THEIRE JOING FEEE IN OUR 50 PLUS ONE WHATTSS WAPP SECRETE PRIVATE GROUP. GOD BLEESS YOU GUYS FOR YOUR PATIENCE AND TRUS TO OUR LOVELY TEACHER OF THE MOMENT

GOD IS WITH ME AND HELPING IN EVRYTHING I DO