

REGISTRATION NUMBER		CENTRE NAME	
CANDIDATE'S FULL NAME			
WEST MATHEMATICS TEACHERS' PEDAGOGIC GROUP GENERAL CERTIFICATE OF EDUCATION MOCK EXAMINATION ORDINARY LEVEL			
CANDIDATE IDENTIFICATION NUMBER	SUBJECT CODE	PAPER NUMBER	
	0570	2	
SUBJECT TITLE: MATHEMATICS		EXAMINATION DATE: 28 th MARCH, 2023	

Two and a Half hours

Enter the information required in the boxes above.

This paper is arranged in two sections, A and B. Answer ALL questions in Sections A and B.

Section A: Answer ALL questions in the spaces provided. The mark allocation for each question is indicated.

Section B: All questions in Section B carry equal marks.

You are reminded of the necessity for good English and orderly presentation in your answers.

In calculations, you are advised to show all the steps in your working, giving your answer at each stage.

Calculators are allowed.

Turn Over

<i>FOR EXAMINERS' USE ONLY</i>	
Marked by:	<u>SCORE</u>
Signature: Date	
Checked by	
Signature: Date	

MARCH 2023 / MTPG / 0570 / 2 / C

SECTION A

ANSWER ALL 15 QUESTIONS IN THIS SECTION.

1. Evaluate $7\frac{1}{3} - 2\frac{1}{7} \div 1\frac{2}{7} + 7 \div 3$

.....
.....
.....

(4 marks)

2. Evaluate 0.4×0.09 leaving your answer

(a) in standard form

(b) as a fraction in its simplest form

.....
.....

(4 marks)

3. Solve for x the equation $8^{x-1} = 128$

.....
.....
.....

(4 marks)

4. The functions f and g are defined on \mathbb{R} , the set of real numbers by:

$$f : x \mapsto 2x - 5 \quad \text{and} \quad g : x \mapsto \sqrt{x + 3}.$$

(a) Find $f(-2)$

.....
.....
.....

(b) Determine $gf(9)$

.....
.....
.....
.....

(c) Define, in a similar manner, f^{-1}

.....
.....
.....
.....
.....

(7 marks)

5. Two statements p and q are such that;

p : John is in form five

q : John John likes Mathematics

(i) Write the following in logical symbols.

(a) John is not in form five.
.....

(b) John is in form five and he likes Mathematics.
.....

(c) If John is in form five, then he likes Mathematics.
.....

(ii) Draw the truth table for $\sim p \implies q$.

.....
.....
.....
.....
.....

(7 marks)

6. Given the sets A , B and ξ , where ξ is the universal set, such that

$$\xi = \{x : 1 \leq x < 11\}$$

$$A = \{x : x \text{ is a prime number}\}$$

$$B = \{x : x \text{ is an } \textit{even} \text{ number}\}$$

(a) List the elements of the sets A , B and ξ

.....
.....
.....
.....

(b) Find $n(A \cup B)$

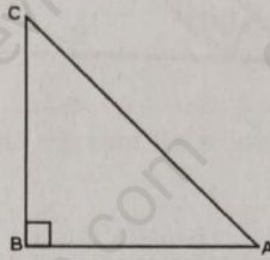
.....

(c) Draw and shade on a Venn diagram, the region described by $A' \cap B'$.

.....
.....
.....

(6 marks)

7. Given the right-angled triangle ABC with the right angle at B and that $\tan A = \sqrt{3}$



(a) Find the distance AC

.....
.....
.....
.....

(b) Write down the value of $\sin A$

.....
.....

(c) Calculate the value of angle A in degrees

.....
.....
.....

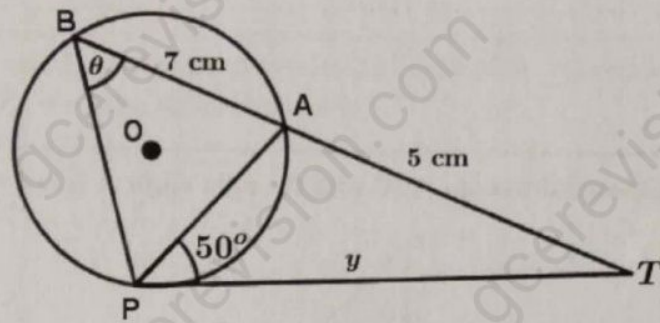
(6 marks)

8. The point $A(p, q)$ is transformed to the point $A'(3, 5)$ by the matrix $\begin{pmatrix} -3 & 1 \\ 7 & -2 \end{pmatrix}$. Find the values p and q .

.....
.....
.....
.....

(5 marks)

9. The figure below is a circle with centre O . Given that PT is a tangent, angle $APT = 50^\circ$, $AB = 7$ cm and $AT = 5$ cm.



Find

- (a) the angle marked θ .

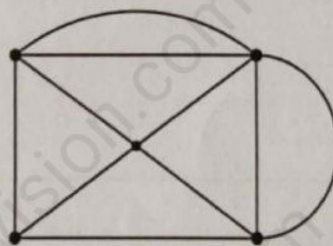
.....

- (b) the value of y .

.....

(5 marks)

10. Given the network below



- (a) State with a reason whether the network is traversable or not.

.....

- (b) What is the number of regions in the network?

.....

(c) State the number of arcs in the network.

.....
(4 marks)

11. Two points P and Q have position vectors $2a\mathbf{i} - 4\mathbf{j}$ and $3\mathbf{i} - b\mathbf{j}$ respectively. Given that $\mathbf{PQ} = -5\mathbf{i} + 7\mathbf{j}$. Find the values of a and b .

.....
.....
.....
(5 marks)

12. Solve the following inequality and represent the solution on the real number line
 $-2 < \frac{2x - 4}{3} \leq 4$.

.....
.....
.....
.....
(5 marks)

13. Given the matrix $\mathbf{T} = \begin{pmatrix} 3 & -2 \\ 1 & 2 \end{pmatrix}$. Find the matrices \mathbf{A} and \mathbf{B} such that

$$\begin{aligned} \mathbf{A} + \mathbf{B} &= 3\mathbf{T} \\ \mathbf{A} - \mathbf{B} &= \mathbf{T} \end{aligned}$$

.....
.....
.....
.....
(5 marks)

14. The n th term T_n of a sequence is given by $T_n = 1 - 2n$.

(a) Write down the first three terms.

.....
.....
.....

(b) Show that the sequence is an arithmetic progression.

.....
.....
.....

(c) Find the sum of the first 10 terms.

.....
.....
.....

(7 marks)

15. (i) The events A and B are such that $P(A) = \frac{1}{5}$, $P(B') = \frac{1}{4}$ and $P(A \cap B) = \frac{1}{6}$. Find;

(a) $P(B)$

.....
.....
.....

(b) $P(A \cup B)$.

.....
.....
.....

(4 marks)

(ii) The mean of 3, 4 and p is 6.

(a) Find the value of p .

.....
.....
.....
.....

(b) Find the mean of 2, p and 14.

.....
.....
.....
.....

(4 marks)

SECTION B

**ANSWER ALL FOUR QUESTIONS IN THIS SECTION.
EACH QUESTION CARRIES 15 MARKS**

1. (i) In 2021, a civil servant of a certain ministry in Cameroon received an annual basic salary of 1, 320, 000 frs and a 7.5% of this basic salary as family allowance.
- (a) Calculate his monthly basic salary.
 - (b) Calculate his total earnings for 2021.
Given that in 2022, his annual basic salary was increased to 1, 485 000 frs.
 - (c) Calculate the percentage increase.
 - (d) What will be his total salary if his family allowance is increased from 7.5% to 9.6%?

- (ii) A triangle ABC has vertices $A(2, 4)$, $B(-5, 6)$ and $C(7, -2)$. Find the image $A'B'C'$ of the triangle ABC under the translation with shift vector $\begin{pmatrix} -3 \\ 4 \end{pmatrix}$.
-

2. (i) In this question, use only a pencil, ruler and a pair of compass.
- (a) Construct a triangle ABC such that $AB = 7$ cm, $BC = 8$ cm and $AC = 8$ cm.
 - (b) Construct the mediators of AB and BC to meet at O.
 - (c) With O as centre, draw a circle to pass through A, B and C.
 - (d) Measure the radius of the circle.
 - (e) What special name is given to the circle drawn?
- (ii) The polynomial $f(x)$ is defined by $f(x) = 2x^3 + 3x^2 - 8x + b$. Given that 1 is a root of equation $f(x) = 0$, find;
- (f) the value of b .
With this value of b ,
 - (g) factorise $f(x)$ completely,
 - (h) solve the equation $f(x) = 0$.
-

3. A survey to determine the number of children per primary school who are bilingual in a certain subdivision in the North West region gave the following results.

3	1	4	3	3	5	1	2	2	4
2	4	3	1	5	3	6	5	4	2
3	0	3	1	5	4	4	2	3	3
4	2	3	1	1	6	0	2	3	1
2	5	4	4	4	2	3	1	3	3

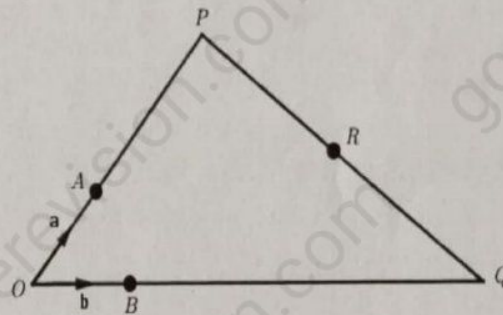
- (a) Construct a frequency distribution for the data.
- (b) State the mode.
- (c) Calculate the median.
- (d) Determine the mean number of children that are bilingual, to the nearest whole number.

- (e) Construct a cumulative frequency table and draw an ogive curve for the distribution.
- (f) Determine the probability that a primary school chosen at random has at most three bilingual children.
-

4. (i) Given that $y = f(x)$, where $f(x) = -x^2 - 2x + 3$.

- (a) Construct a table of values of y for $-4 \leq x \leq 2$, $x \in \mathbb{Z}$
- (b) Taking 1 cm to represent 1 unit on both axes, draw the graph of $y = f(x)$.
- (c) On the same axes draw the line $y = x + 3$.
- Using the graph,
- (d) determine the coordinates of the turning point of the curve.
- (e) Solve the equation $-x^2 - 2x + 3 = x + 3$.

(ii) Consider the figure below.



Given that $AP = 2OA$, $OB = \frac{1}{3}BQ$, and that R is the midpoint of PQ. Express the following vectors in terms of \mathbf{a} and \mathbf{b} .

- (a) \mathbf{PQ} .
- (b) \mathbf{OR} .
-