

CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

General Certificate Of Education Examination

ADDITIONAL MATHEMATICS 1

575

JUNE 2015

ORDINARY LEVEL

Centre Number	
Centre Name	
Candidate Number	
Candidate Name	

Mobile phones are NOT allowed in the examination room.

MULTIPLE CHOICE QUESTION PAPER

One and a half Hours

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you start answering the questions in this paper. Make sure you have a soft HB pencil and an eraser for this examination.

1. USE A SOFT HB PENCIL THROUGHOUT THE EXAMINATION.
2. DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

Before the examination begins:

3. Check that this question booklet is headed "Ordinary Level – 575 Additional Mathematics 1"
4. Fill in the information required in the spaces above.

5. Fill in the information required in the spaces provided on the answer sheet using your HB pencil:
Candidate Name Number, Center Number Name.

Take care that you do not crease or fold the answer sheet or make any marks on it other than those asked for in these instructions.

How to answer the questions in this examination:

6. Answer ALL the 50 questions in this Examination. All questions carry equal marks.
7. Calculators are allowed.
8. Each question has FOUR suggested answers: A, B, C and D. Decide on which answer is correct. Find the number of the question on the Answer Sheet and draw a horizontal line across the letter to join the square brackets for the answer you have chosen.
For example, if C is your correct answer, mark C as shown below:
[A] [B] [C] [D]
9. Mark only one answer for each question. If you mark more than one answer, you will score a zero for that question. If you change your mind about an answer, erase the first mark carefully, then mark your new answer.
10. Avoid spending too much time on any one question. If you find a question difficult, move on to the next question. You can come back to this question later.
11. Do all rough work in this booklet, using, where necessary, the blank spaces in the question booklet.
12. At the end of the examination, the invigilator shall collect the answer sheet first and then the question booklet after. DO NO ATTEMPT TO LEAVE THE EXAMINATION HALL WITH IT.

Turn Over

23. The distance between the points (0,1) and (-4,4) is

- A: $\sqrt{7}$
- B: 7
- C: 5
- ~~D: $\sqrt{41}$~~

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\sqrt{(-4 - 0)^2 + (4 - 1)^2}$$

$$\sqrt{(-4)^2 + (3)^2}$$

$$\sqrt{16 + 9}$$

$$\sqrt{25}$$

$$5$$

24. The tangent of the acute angle between the lines $y = 0$ and $y = 3x + 6$ is:

- A: 2
- B: 1
- ~~C: 3~~
- D: -3

$$\frac{M_2 - M_1}{1 + M_1 M_2}$$

$$\frac{3 - 0}{1}$$

25. The value of p for the points (2, 1), (6, 3) and (4, p) are collinear is:

- ~~A: 2~~
- B: 1
- C: -1
- D: -2

x_1	y_1	2	1
x_2	y_2	6	3
x_3	y_3	4	p
x_1	y_1	2	1

$$\frac{1}{2}(6 - 2) = (p - 1)$$

$$\frac{1}{2}(6 + 6 - 4) = (p - 1)$$

$$\frac{1}{2}(10 + 6p) = (p - 1)$$

$$5 + 3p = p - 1$$

$$2p = -6$$

$$p = -3$$

26. The perpendicular distance from the point (-1, 3) to the line $2x - y + 6 = 0$ is:

- A: $\sqrt{5}$
- ~~B: $\frac{1}{\sqrt{5}}$~~
- C: $\frac{7}{\sqrt{5}}$
- D: $\frac{11}{\sqrt{5}}$

$$\frac{|2(-1) - 3 + 6|}{\sqrt{2^2 + (-1)^2}}$$

$$\frac{|-2 - 3 + 6|}{\sqrt{5}}$$

$$\frac{|1|}{\sqrt{5}}$$

$$\frac{1}{\sqrt{5}}$$

27. The range of values of x for which $(x + 3)(x - 2) \leq 0$ is:

- A: $x \leq -3 \cup x \geq 2$
- ~~B: $-3 \leq x \leq 2$~~
- C: $-2 \leq x \leq 3$
- D: $x \leq -2 \cup x \geq 3$

28. The range of values of x for which $5x - 2 < 1 + 6x$ is:

- A: $x < -3$
- ~~B: $x > -3$~~
- C: $x < 3$
- D: $x > 3$

$$5x - 2 < 1 + 6x$$

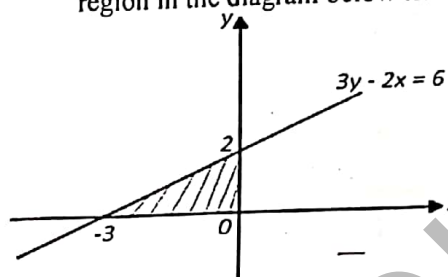
$$-2 < 3$$

$$x > 3$$

29. The values of x for which $|x - 2| = 3$ are:

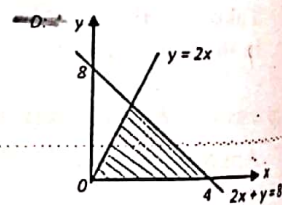
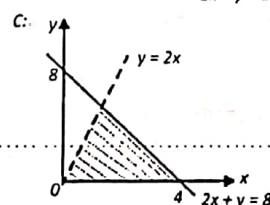
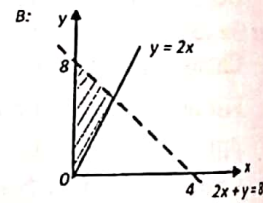
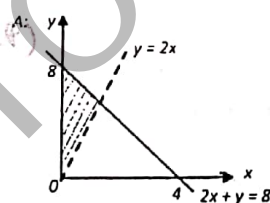
- ~~A: -1, 5~~
- B: 1, -5
- C: 1, 5
- D: -1, -5

30. The set of inequalities which satisfy the shaded region in the diagram below is:

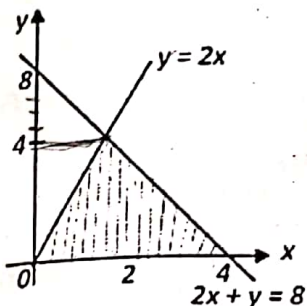


- ~~A: $x < 0, y > 0, 3y - 2x \leq 6$~~
- B: $x > 0, y > 0, 3y - 2x \leq 6$
- C: $x < 0, y < 0, 3y - 2x \geq 6$
- D: $x > 0, y < 0, 3y - 2x \leq 6$

31. Which of the shaded region below satisfies the set of inequalities? $y \geq 0, y \leq 2x, 2x + y \leq 8$.



32.



The shaded region is bounded by the inequalities $y \geq 0$, $y \leq 2x$ and $2x + y \leq 8$.

The maximum value of $2x + y$ constrained by the inequalities is:

- A 3
- B 7
- C 8
- D 15

33. Given the functions $f: x \mapsto x - 3$ and

$g: x \mapsto x^2 + 3$. The composite function gf is:

- A $x^2 - 6x + 9$
- ~~B~~ $x^2 - 6x - 6$
- C $x^2 - 6x + 12$
- D $x^2 + 12$

34. Given that $g: x \rightarrow kx - 5$, the value of k for which $g^{-1}(-3) = 4$ is:

- A -2
- B $-\frac{1}{2}$
- ~~C~~ $\frac{1}{2}$
- D 2

35. The transformation T is defined as

$$T: (x, y) \rightarrow (2x - y, x + 2y)$$

Which of the following matrices represent the transformation T ?

- A: $\begin{pmatrix} 2 & 1 \\ 1 & -2 \end{pmatrix}$
- ~~B:~~ $\begin{pmatrix} 2 & -1 \\ 1 & 2 \end{pmatrix}$
- C: $\begin{pmatrix} 2 & 2 \\ -1 & 2 \end{pmatrix}$
- D: $\begin{pmatrix} 1 & 2 \\ 2 & -1 \end{pmatrix}$

36. A certain transformation T is defined by $T: (x, y) \rightarrow (x + 2, 2x - y)$, the image of the point $(4, -2)$ is:

- A: (6, 6)
- B: (4, -2)
- ~~C:~~ (6, 10)
- D: (6, -10)

$(4+2, 2(4) - (-2)) = (6, 10)$

37. The invariant line under the transformation M ,

where $M = \begin{pmatrix} 3 & 1 \\ 2 & 2 \end{pmatrix}$ is:

- A $2x - y = 0$
- ~~B~~ $2x + y = 0$
- C $3x + y = 0$
- D $2x + 2y = 0$

$\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} x \\ y \end{pmatrix}$
 $3x + y = 2x + 2y$
 $x - y = 0$
 $2x + y = 0$

38. The transformation matrix

$M = \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$ represents

- A A rotation through 90° clockwise centred at the origin $(0, 0)$
- ~~B~~ A rotation through 90° anticlockwise centred at the origin $(0, 0)$
- C A reflection in the x -axis
- D An enlargement

39. The binary operation $*$ is defined over the

set of positive integers as $x * y = x^2 + y^2 + 2$

Given that $x * 4 = 3x^2$, the value of x is:

- ~~A:~~ 3
- B: $\sqrt{5}$
- C: $\sqrt{6}$
- D: $\sqrt{10}$

$x^2 + 18 = 3x^2$
 $-2x^2 = -18$
 $\frac{-2x^2}{-2} = \frac{-18}{-2}$
 $x^2 = 9$
 $x = \pm 3$
 $x = 3$

40. The operation table for the group $(G, *)$,

where $G = (1, 4, 7, 13)$ is shown below:

*	1	4	7	13
1	1	4	7	13
4	4	1	13	7
7	7	13	4	1
13	13	7	1	4

The inverse of the element 7 is:

- A: 1
- B: 4
- C: 7
- ~~D:~~ 13

Turn over

41. The operation table for the group $(S, *)$ is shown below

*	1	3	5	7
1	1	3	5	7
3	3	1	7	5
5	5	7	1	3
7	7	5	3	1

One subgroup of this group is:

- A $(\{3, 5\}, *)$
~~B~~ $(\{1, 3\}, *)$
 C $(\{5, 7\}, *)$
 D $(\{3, 5, 7\}, *)$

42. The operation $*$ on the set $\{1, 3, 5, 7\}$ forms a group, the order of the group is:

- A 1
 B 2
 C 3
~~D~~ 4

43. The direction of the vector $r = i - 2j + \lambda(4i - 3j)$ is:

- A: $i - 2j$
~~B~~: $4i - 3j$
 C: $4i - 2j$
 D: $5i - 5j$

44. Given that $\vec{a} = 2i - qj$ and $\vec{b} = -3i + j$, then value of q for which \vec{a} and \vec{b} are perpendicular is:

- A: $-\frac{3}{2}$
 B: $-\frac{2}{3}$
~~C~~: -6
 D: 6

45. The vector equation of the line joining the points with position vectors $3i + j$ and $2i + 3j$ is:

- A: $r = 3i + j + \lambda(5i + 4j)$
 B: $r = i + 2j + \lambda(3i + j)$
~~C~~: $r = 3i + j + \lambda(-i + 2j)$
 D: $r = 3i + 2j + \lambda(i - 2j)$

46. Given that $y = x^3 + 3x + 1$, then $\frac{dy}{dx} =$

- ~~A~~ $3x^2 + 3$
 B $\frac{1}{3}x^2 + 3$
 C $x^4 + 3x^2 + x$
 D $\frac{x^4}{4} + \frac{3x^2}{2}$

47. $\frac{d}{dx}(x \cos x) = -x \sin x + \cos x$

- A $x \cos x$
 B $-x \sin x$
~~C~~ $\cos x - x \sin x$
 D $\cos x + x \sin x$

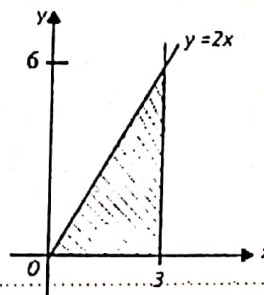
48. Given that the curve $y = f(x)$ has a minimum value at $x = a$, then which of the following conditions satisfy this statement?

- A: $f'(a) = 0$ and $f''(a) < 0$
 B: $f'(a) = 0$ and $f''(a) = 0$
~~C~~: $f'(a) = 0$ and $f''(a) > 0$
 D: $f'(a) < 0$ and $f''(a) < 0$

49. $\int (1 + \cos x) dx = 1 + \sin x$

- ~~A~~: $\sin x + k$
 B: $-\sin x + k$
 C: $x + \sin x + k$
 D: $x - \sin x + k$

50.



The area bounded by the line $y = 2x$, the x -axis and the ordinate $x = 3$ is:

- A: $\frac{9}{2}$
 B: $\frac{3}{2}$
 C: 6
~~D~~: 9

**STOP
 NOW GO BACK AND CHECK YOUR
 WORK**