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 $\boldsymbol{r} = \boldsymbol{i} - 2\boldsymbol{j} + \lambda(4\boldsymbol{i} - 3\boldsymbol{j})$ is:

A: $\mathbf{i}-2\mathbf{j}$
B: $\mathbf{4i}-\mathbf{3j}$
C: $\mathbf{4i}-2\mathbf{j}$
D: $\mathbf{5i}-5\mathbf{j}$

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 $3\boldsymbol{i} + \boldsymbol{j}$ and $2\boldsymbol{i} + 3\boldsymbol{j}$ 22

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

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. $\frac{d}{dx}(x\cos x) =$

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

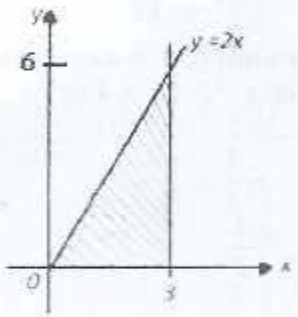
48. Given that the curve $y = f(x)$ has a minimum value at $x = a$, then which of the following conditions satisfy this statement?

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

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

CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

General Certificate Of Education Examination

ADDITIONAL MATHEMATICS I

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.**

1. $4^{\frac{3}{2}} =$

A: 6
B: 8
C: 12
D: 16

2. $\frac{\log 27}{\log 9} =$

A: 18
B: 1
C: $\frac{3}{2}$
D: 3

3. $\sqrt{98} =$

A: $7\sqrt{2}$
B: $2\sqrt{7}$
C: $49\sqrt{2}$
D: $7\sqrt{14}$

4. Given that α and β are the roots of the equation $x^2 - 6x + 5 = 0$, then the value of $-\alpha - \beta$ is:

A: 6
B: 5
C: -6
D: -5

5. The equation whose roots are 1 and -1 is:

A: $x^2 - 2x + 1 = 0$
B: $x^2 - 2x - 1 = 0$
C: $x^2 - 1 = 0$
D: $x^2 + 1 = 0$

6. Given that $ax^2 + bx + c = 0$ has real and equal roots where a, b and c are real constants, then which of the following is correct?

A: $b^2 - 4ac \geq 0$
B: $b^2 - 4ac > 0$
C: $b^2 - 4ac > 0$
D: $b^2 - 4ac < 0$

7. Given that $(x-2)$ is a factor of $x^3 - 2x^2 + kx + 2$. The value of k is:

A: -7
B: -1
C: 1
D: 7

8. The remainder when the expression $x^3 - x^2 + x + 4$ is divided by $(x+1)$ is:

A: 6
B: 1
C: 3
D: 5

9. The n^{th} term, U_n of a sequence is given as $U_n = (-1)^{n+1}\left(\frac{2}{3}\right)^n$. Then the fifth term of the sequence is:

A: $\frac{32}{243}$
B: $\frac{-32}{81}$
C: $\frac{32}{81}$
D: $\frac{32}{243}$

10. The n^{th} term of the series -3+2+7+ . . . is:

A: $5n - 2$
B: $5n - 8$
C: $5n + 2$
D: $5n + 8$

11. The sum of the geometric progression with first term a and common ratio r, where $r < 1$, is:

A: ar^{n-1}
B: ar^n
C: $\frac{a(1-r^n)}{1-r}$
D: $\frac{a(r^n - 1)}{r - 1}$

12. The sum to infinity of a geometric progression is 3 and the first term is 2. The value of the common ratio is :

A -3

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

C $\frac{1}{3}$

D 3

13. The first three terms, in ascending powers of x, in the binomial expansion of $(1-2x)^{-1}$ are:

A $1-x+4x^2$

B $1+x+4x^2$

C $1+2x+4x^2$

D $1-2x-4x^2$

14. The coefficient of x^3 in the binomial expansion of $(1-2x)^6$ is:

A -60

B -30

C 30

D 60

15. The numbers of ways in which the letter of the word "**SWEET**" can be arrange is:

A 120

B 60

C 30

D 24

16. The value of ${}^6C_4$ is:

A 3

B 4

C 15

D 30

17. $\tan 225° =$

A $-\sqrt{3}$

B -1

C 1

D $\sqrt{3}$

18. $\cos^2 x - \sin^2 x \equiv$

A $\cos 2x$

B $\sin 2x$

C $1-\sin^2 x$

D $2\cos^2 x + 1$

19. The value of θ, $0 \le \theta \le 360°$, for which $\tan\theta = \sqrt{3}$ is:

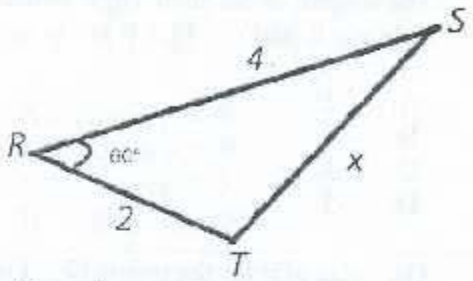
A $30°, 210°$

B $60°, 330°$

C $60°, 240°$

D $60°, 120$

20 In triangle RST, the value of x is:



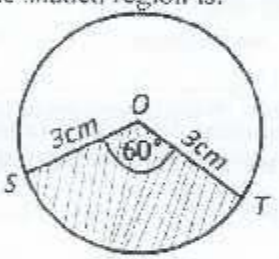
A 4

B $3\sqrt{2}$

C $2\sqrt{3}$

D 12

21. From the diagram, the area in square unit of the shaded region is:



A $\frac{3}{2}\pi$

B 3π

C $\frac{3}{4}\pi$

D $\frac{2}{3}\pi$

22. The period of the function $y = \sin x$ is

A: $\frac{\pi}{2}$

B: π

C: $\frac{3}{2}\pi$

D: 2π

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

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

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

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

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: $\frac{11}{\sqrt{5}}$

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

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

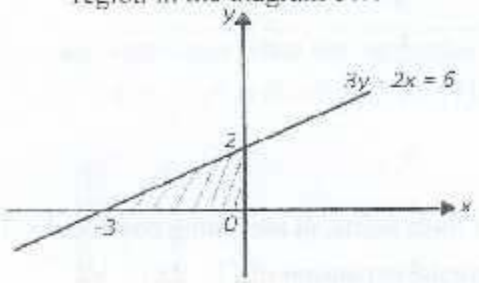
28. The range of values of x for which $5x - 2 < 1 + 6x$ is:

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

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

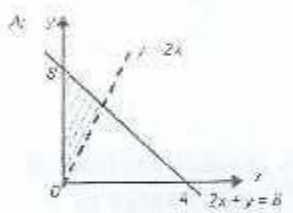
A: $-1, 5$
B: $1, -5$
C: $1, 5$
D: $-1, -5$

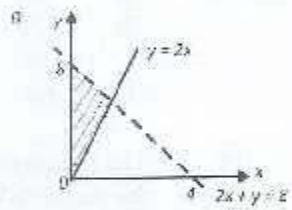
30. The set of inequalities which satisfy the shaded region in the diagram below is:

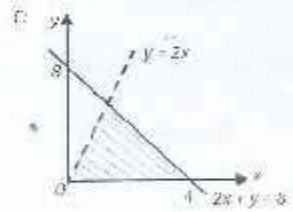


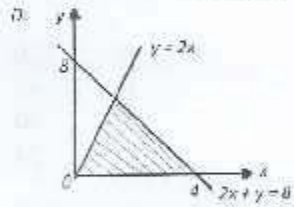
A: $x < 0, y > 0, 3y - 2x \leq 6$
B: $x > 0, y > 0, 3y - 2x \leq 6$
C: $x < 0, y < 0, 3y \quad 2x \geq 6$
D: $x > 0, y < 0, 3y - 2x \leq 6$

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

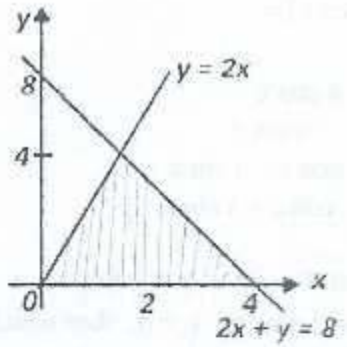
A:


B:


C:


D:


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 $g: x \mapsto kx - 5$, 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: $(6, -10)$

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 $2x + 2y = 0$

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: $\sqrt{10}$

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