AFFIX SEAL HERE

CANDIDATE – PLEASE NOTE!
You must sign below and return this booklet with the Answer Sheet. Failure to do so may result in disqualification.

Signature

FORM TP 2010086

TEST CODE **01234010**

MAY/JUNE 2010

CARIBBEAN EXAMINATIONS COUNCIL

SECONDARY EDUCATION CERTIFICATE EXAMINATION

Dana C. Davis

MATHEMATICS

Paper 01 – General Proficiency

90 minutes

19 MAY 2010 (p.m.)

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This test consists of 60 items. You will have 90 minutes to answer them.
2. In addition to this test booklet, you should have an answer sheet.
3. **A list of formulae is provided on page 2 of this booklet.**
4. Each item in this test has four suggested answers, lettered (A), (B), (C), (D). Read each item you are about to answer, **and decide which choice is best.**
5. On your answer sheet, find the number which corresponds to your item and shade the space having the same letter as the answer you have chosen. Look at the sample item below.

Sample Item

$2a + 6a =$

(A) $8a$
(B) $8a^2$
(C) $12a$
(D) $12a^2$

Sample Answer

● Ⓑ Ⓒ Ⓓ

The best answer to this item is "$8a$", so answer space (A) has been shaded.

6. If you want to change your answer, erase it completely before you fill in your new choice.
7. When you are told to begin, turn the page and work as quickly and as carefully as you can. If you cannot answer an item, go on to the next one. You may return to the omitted item later. Your score will be the total number of correct answers.
8. You may do any rough work in the booklet.
9. Calculators and mathematical tables are NOT allowed for this paper.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

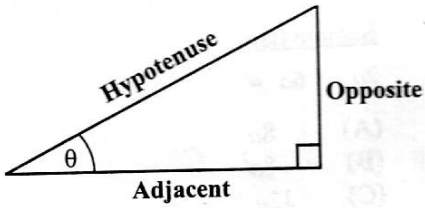
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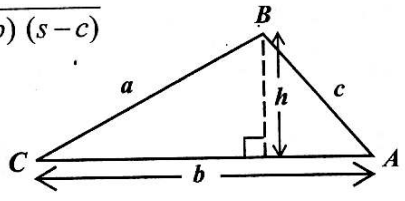
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LIST OF FORMULAE

Volume of a prism	$V = Ah$ where A is the area of a cross-section and h is the perpendicular length.
Volume of cylinder	$V = \pi r^2 h$ where r is the radius of the base and h is the perpendicular height.
Volume of a right pyramid	$V = \frac{1}{3}Ah$ where A is the area of the base and h is the perpendicular height.
Circumference	$C = 2\pi r$ where r is the radius of the circle.
Arc length	$S = \frac{\theta}{360} \times 2\pi r$ where θ is the angle of the sector.
Area of a circle	$A = \pi r^2$ where r is the radius of the circle.
Area of a sector	$A = \frac{\theta}{360} \times \pi r^2$ where θ is the angle of the sector.
Area of trapezium	$A = \frac{1}{2}(a+b)h$ where a and b are the lengths of the parallel sides and h is the perpendicular distance between the parallel sides.
Roots of quadratic equations	If $ax^2 + bx + c = 0$, then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Trigonometric ratios	$\sin\theta = \frac{\text{opposite side}}{\text{hypotenuse}}$ $\cos\theta = \frac{\text{adjacent side}}{\text{hypotenuse}}$ $\tan\theta = \frac{\text{opposite side}}{\text{adjacent side}}$



Area of triangle	Area of $\Delta ABC = \frac{1}{2}bh$ where b is the length of the base and h is the perpendicular height Area of $\Delta ABC = \frac{1}{2}ab\sin C$ Area of $\Delta ABC = \sqrt{s(s-a)(s-b)(s-c)}$ where $s = \frac{a+b+c}{2}$
Sine rule	$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
Cosine rule	$a^2 = b^2 + c^2 - 2bc\cos A$



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1. The number 3.14063 written correct to 3 decimal places is

(A) 3.140
(B) 3.141
(C) 3.146
(D) 3.150

2. $(-3)^2 + (-2)^2 =$

(A) -13
(B) -10
(C) 13
(D) 25

3. In scientific notation, 170.04 is written as

(A) 0.17004×10^3
(B) 1.7004×10^2
(C) 17.004×10^1
(D) 1.7004×10^{-2}

4. $0.386 \times 0.06 =$

(A) 0.02316
(B) 0.2316
(C) 2.316
(D) 23.16

5. What number when added to $1\frac{1}{3}$ gives 2?

(A) $\frac{1}{3}$
(B) $\frac{2}{3}$
(C) 1
(D) 3

6. The EXACT value of $\frac{37.26 \div 1.8}{1\,000}$ is

(A) 0.207
(B) 0.0207
(C) 20.7000
(D) 20 700

7. The H.C.F. of 12, 15 and 60 is

(A) 3
(B) 5
(C) 12
(D) 60

8. The number 301 can be written as

(A) $3 \times 10^3 + 1 \times 10$
(B) $3 \times 10^2 + 1 \times 10$
(C) $3 \times 10^3 + 1$
(D) $3 \times 10^2 + 1$

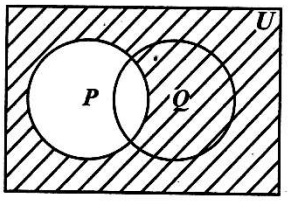
9. If $3n$ is an odd number, which of the following is an even number?

(A) $3n - 1$
(B) $3n - 2$
(C) $3n + 2$
(D) $3n + 2n$

10. 25×130 is the same as

(A) $(25 \times 100) + 30$
(B) $(25 + 30) \times 100$
(C) $(25 \times 30) + (25 \times 100)$
(D) $(100 \times 30) + (100 \times 25)$

Item **11** refers to the Venn diagram below.



11. In the Venn diagram above, the shaded area represents

(A) P'
(B) $(P \cup Q)'$
(C) $Q \cap P'$
(D) $Q \cup P'$

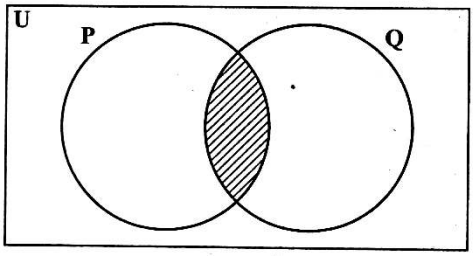
12. In a class of 32 students, 17 study Music and 20 study Art. What is the LEAST number of students who are studying BOTH Music and Art?

(A) 3
(B) 5
(C) 12
(D) 15

13. If $P = \{a, b, c\}$ then the number of subsets of P is

(A) 8
(B) 6
(C) 4
(D) 3

Item **14** refers to the Venn diagram below.



14. If P = {Factors of 6} and Q = {Factors of 4}, then the shaded region represents

(A) { }
(B) {1, 2}
(C) {4, 6, 8 ...}
(D) {12, 24, 36, ...}

15. If TT$6.00 is equivalent to US$1.00, then TT$15.00 in U.S. dollars is

(A) $0.25
(B) $0.40
(C) $2.50
(D) $4.00

16. $3\frac{1}{4}$% of $500 is

(A) $ 1.62
(B) $15.52
(C) $16.00
(D) $16.25

17. If p sweets cost q cents, then the cost of one sweet is

(A) $\frac{q}{p}$ cents

(B) pq cents

(C) $\frac{p}{q}$ cents

(D) $(q - p)$ cents

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18. A salesman is paid 5% of his sales as commission. His sales for last month were $2 020. How much commission was he paid?

(A) $ 11.00
(B) $ 20.20
(C) $101.00
(D) $110.00

19. How much does a customer pay for an article marked at $50.00 if a sales tax of 6% is charged?

(A) $56.00
(B) $53.00
(C) $47.00
(D) $44.00

20. A table is sold on hire purchase. The sale price consists of a deposit of $306 and six monthly instalments of $60 each. How much does a customer pay for the table?

(A) $360
(B) $366
(C) $666
(D) $966

21. A loan of $8 000 was repaid in 2 years in monthly payments of $400.00. The interest on the loan, as a percentage, was

(A) 5%
(B) 8%
(C) 16%
(D) 20%

22. A man pays 60 cents for every 200 m^3 of gas used, plus a fixed charge of $13.75. How much does he pay when he uses 55 000 m^3 of gas?

(A) $178.75
(B) $175.25
(C) $165.00
(D) $151.25

23. $(8a)^2 =$

(A) $16a$
(B) $64a$
(C) $16a^2$
(D) $64a^2$

Item 24 refers to the expansion below.

$$(x + a)(x + b) = x^2 + (a + b)x + ab$$

24. The middle term in the expansion of $(x + 3)(x - 1)$ is

(A) 2
(B) 3
(C) $2x$
(D) $4x$

25. $5(x + y) - 3(x - y) =$

(A) $2x$
(B) $2x + 2y$
(C) $2x + 8y$
(D) $8x + 8y$

26. $\frac{4x}{7y} + \frac{3x}{5y}$ may be written as

(A) $\frac{41x}{35y}$

(B) $\frac{41x^2}{35y}$

(C) $\frac{41xy}{35y}$

(D) $\frac{20x + 21y}{35y}$

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27. If $a * b = \frac{b}{a} - 1$, then $7 * 28 =$

(A) $-\frac{3}{4}$

(B) $\frac{1}{4}$

(C) 3

(D) 4

28. Given $2x + 3 \geq 9$, the range of values of x is

(A) $x > 6$
(B) $x \geq 6$
(C) $x > 3$
(D) $x \geq 3$

29. If x = –2, y = 3, t = 2, then $\left(\frac{x}{y}\right)^t =$

(A) $-\frac{4}{9}$

(B) $\frac{4}{9}$

(C) $\frac{4}{3}$

(D) $\frac{9}{4}$

30. When 6 is added to a number and the sum is divided by three, the result is four. This statement written in mathematical symbols is

(A) $\frac{6+x}{3} = 4$

(B) $\frac{6}{3} + x = 4$

(C) $\frac{6+x}{3} = \frac{4}{3}$

(D) $6 + \frac{x}{3} = 4$

31. The values of x and y which satisfy the equations $x + 2y = 27$ and $2x - y = 19$ are respectively

(A) 15 and 10
(B) 10 and 15
(C) 7 and 13
(D) 13 and 7

32. The volume of a cube of edge 10 cm is

(A) 30 cm^3
(B) 100 cm^3
(C) 300 cm^3
(D) 1000 cm^3

33. 2500 millimetres expressed in metres is

(A) 0.25
(B) 2.5
(C) 25
(D) 250

34. A boy leaves home at 09:15 hours and arrives at school at 10:05 hours. If he travels non-stop at an average speed of 6 kmh^{-1}, what is the distance, in km, of his home from school?

(A) 2 km
(B) 5 km
(C) 6 km
(D) 9 km

35. The distance around the edge of a circular pond is 88 m. The radius, in metres, is

(A) 176π

(B) 88π

(C) $\frac{88}{\pi}$

(D) $\frac{88}{2\pi}$

36. A man leaves home at 22:15 hrs and reaches his destination in the same time zone at 04:00 hrs on the following day. How many hours did the journey take?

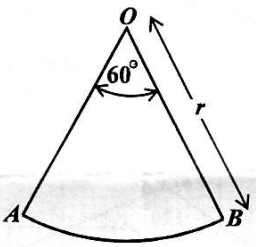
(A) 5

(B) $5\frac{3}{4}$

(C) 6

(D) $6\frac{1}{4}$

Item 37 refers to the diagram below.



37. AOB is a sector of a circle such that angle $AOB = 60°$ and OB is r units long. The area of AOB is

(A) $\frac{1}{3}\pi r$

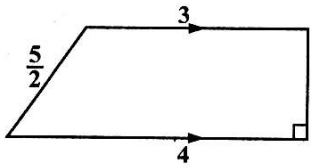
(B) $\frac{1}{6}\pi r$

(C) $\frac{1}{3}\pi r^2$

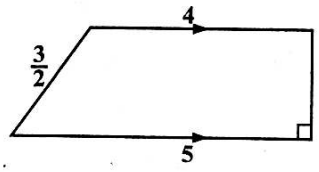
(D) $\frac{1}{6}\pi r^2$

38. Which of the figures below, **not drawn to scale**, has an area equal to $\frac{1}{2}(3 + 4) \times 5$ square units?

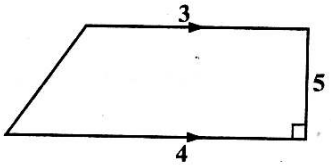
(A)



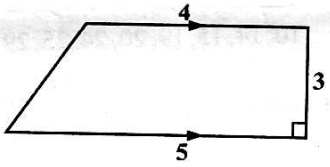
(B)



(C)



(D)



39. The area of a triangle is 30 cm² and its base is 10 cm. What is the perpendicular height, in cm, of the triangle?

(A) 6
(B) 12
(C) 13
(D) 17

40. The median of the numbers:
1, 1, 5, 5, 6, 7, 7, 7, 7, 8 is

(A) 5.4
(B) 6
(C) 6.5
(D) 7

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41. Six hundred students write an examination. The probability of a randomly selected student failing the examination is $\frac{1}{5}$. How many students are expected to pass?

(A) 120
(B) 480
(C) 500
(D) 600

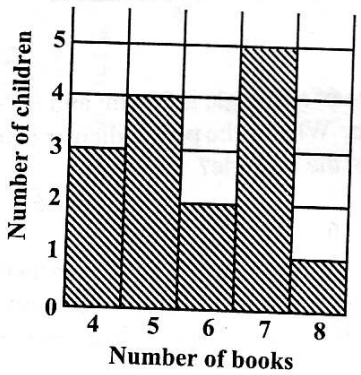
42. The lengths of 30 cabbage leaves were measured, to the nearest cm, and the information grouped as shown in the table below.

Length of Leaf (cm)	10-14	15-19	20-24	25-29
Frequency	3	8	12	7

The limits of the class intervals are

(A) 3, 8, 12, 7
(B) 5, 5, 5, 5
(C) 9.5, 14.5, 19.5, 24.5, 29.5
(D) 10, 14, 15, 19, 20, 24, 25, 29

Item **43** refers to the following bar chart.



43. The bar chart above shows the number of books read by the children who took part in a survey.

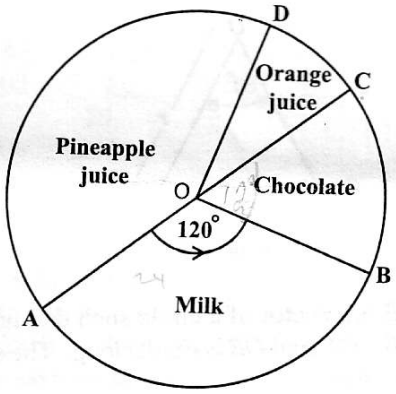
How many children took part in the survey?

(A) 5
(B) 15
(C) 75
(D) 87

44. Each of the letters of the word 'CHANCE' is written on a slip of paper similar in size and shape. The slips of paper are then placed in a bag and thoroughly shaken. What is the probability of drawing a letter 'C'?

(A) $\frac{1}{6}$
(B) $\frac{1}{5}$
(C) $\frac{1}{3}$
(D) $\frac{2}{3}$

Item **45** refers to the following diagram.



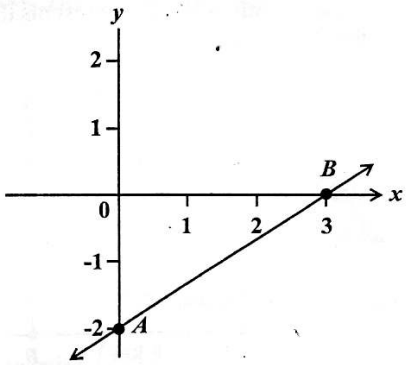
45. The pie-chart above shows the preference in drinks of a group of students. If 12 students prefer chocolate, then the TOTAL number of students is

(A) 48
(B) 72
(C) 180
(D) 360

46. Which of the following represents the equation of a straight line?

(A) $y = 2x + 3$
(B) $y = \frac{4}{x}$
(C) $y = x^2 - 4$
(D) $y = x^2 + 2x - 5$

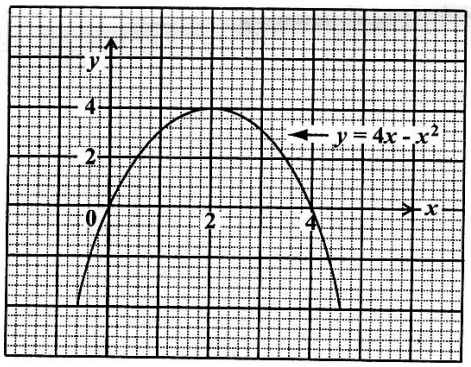
Item **47** refers to the graph below.



47. The straight line AB cuts the Y axis at

(A) (0, 3)
(B) (0, 2)
(C) (3, -2)
(D) (0, -2)

Item **48** refers to the following graph.

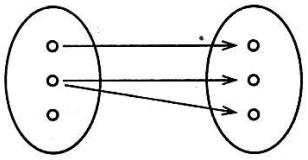


48. The values of x for which $y = 4x - x^2$ intersects $y = 0$ are

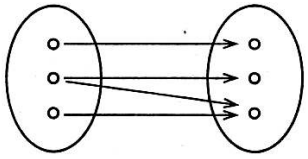
(A) $x = 0$ and $x = 4$
(B) $x = 0$ and $x = 2$
(C) $x = 0$ and $x = -4$
(D) $x = 2$ and $x = 4$

49. Which of the following diagrams illustrates a function?

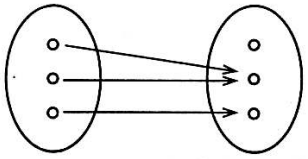
(A)



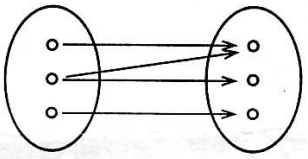
(B)



(C)



(D)

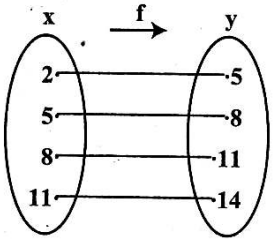


50. If $f(x) = x^2 - x - 1$, then $f(-5) =$

(A) –31
(B) 19
(C) 24
(D) 29

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Item **51** refers to the following diagram of a function.

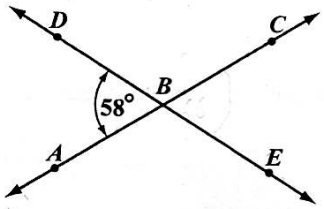


51. Which of the following BEST describes the function?

(A) $f(x) = 3 - x$
(B) $y = x$
(C) $f(x) = x + 3$
(D) $x = y + 3$

Item **52** refers to the diagram below.

AC and DE are straight lines intersecting at B. Angle $DBA = 58°$.



52. The measure of angle ABE is

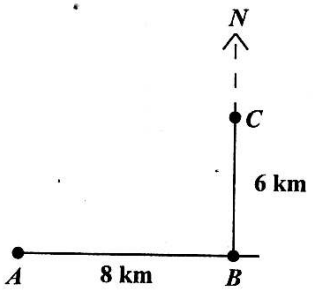
(A) 58°
(B) 122°
(C) 142°
(D) 302°

53. If the sum of the interior angles of a polygon is 4 right angles, the polygon is a

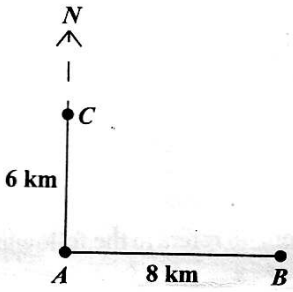
(A) triangle
(B) hexagon
(C) pentagon
(D) quadrilateral

54. A ship sailed 8 km due east from A to B, then sailed 6 km due north to C. Which diagram below BEST represents the path of the ship?

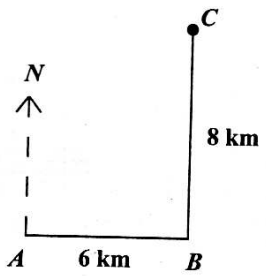
(A)



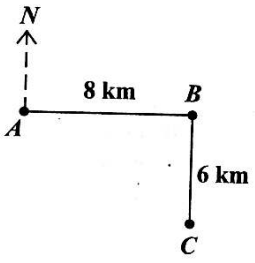
(B)



(C)



(D)



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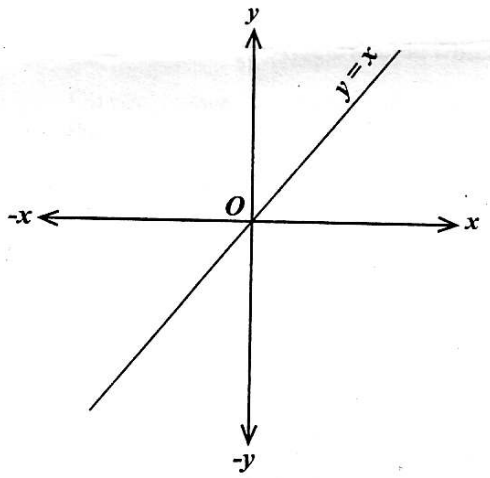
55. A plane is heading in a direction of 045° and changes course in a clockwise direction to 135°. The angle through which the plane turns is

(A) 45°
(B) 90°
(C) 135°
(D) 270°

56. The image of the point P(–3, 2) under the translation $\begin{pmatrix} 2 \\ 1 \end{pmatrix}$ is

(A) (–5, 3)
(B) (–2, 4)
(C) (–1, 3)
(D) (–1, 1)

Item 57 refers to the following diagram.



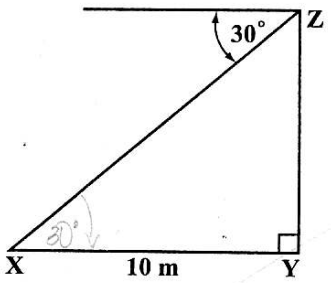
57. In the diagram above, if the line $y = x$ is rotated anti-clockwise about O through 90°, what is its image?

(A) $y = 0$
(B) $x = 0$
(C) $y = x$
(D) $y = -x$

58. A ladder 5 metres long is leaning against a vertical wall. The foot of the ladder is 3 m away from the wall. How far up the wall does the ladder reach?

(A) 4 m
(B) 6 m
(C) 8 m
(D) 15 m

Item 59 refers to the diagram below.



59. The diagram above, **not drawn to scale**, shows that the angle of depression of a point X from Z is 30°. If X is 10 metres from Y, the height of YZ, in metres, is

(A) 10 tan 60°
(B) 10 cos 60°
(C) 10 tan 30°
(D) 10 sin 30°

60. In a triangle ABC, angle $A = x°$ and angle B, $2x°$. What is the size of angle C?

(A) 60°
(B) 45°
(C) $(180 - 3x)°$
(D) $\left(\frac{180}{3x}\right)°$

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST.