2018

238

A004

CANDIDATE – PLEASE NOTE!

PRINT your name on the line below and return this booklet with your answer sheet. Failure to do so may result in disqualification.

TEST CODE **01234010**

FORM TP 2022018

JANUARY 2022

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

MATHEMATICS

Paper 01 – General Proficiency

1 hour 30 minutes

04 JANUARY 2022 (p.m.)

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This test consists of 60 items. You will have 1 hour and 30 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

● (B) (C) (D)

The best answer to this item is "$8a$", so (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 that item later.
8. You may do any rough work in this booklet.
9. Calculators and mathematical tables are NOT allowed for this paper.
10. ALL diagrams in this booklet are NOT drawn to scale, unless otherwise stated.

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

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1. What percentage of 40 is 8?

(A) 5
(B) 20
(C) 32
(D) 150

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

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

3. If $4.3 \times 0.37 = 1.591$, then 0.43×370 is

(A) 1.591
(B) 15.91
(C) 159.1
(D) 1591.0

4. The first 3 common multiples of 3, 4 and 6 are

(A) 0, 1, 2
(B) 3, 4, 6
(C) 6, 8, 12
(D) 12, 24, 36

5. If \$350 is shared in the ratio 2:5, the SMALLER share is

(A) \$ 50
(B) \$ 70
(C) \$100
(D) \$150

6. There are 40 students in a class. Girls make up 60% of the class. 25% of the girls wear glasses. How many girls in the class wear glasses?

(A) 6
(B) 8
(C) 10
(D) 15

7. If the universal set $U = \{1, 2, 3, 4, 5, 6\}$ and $H = \{3, 4, 6\}$, then $H' =$

(A) $\{1, 3, 5\}$
(B) $\{1, 2, 5\}$
(C) $\{2, 4, 6\}$
(D) $\{3, 4, 6\}$

8. Which of the following statements describes the set of integers greater than -3 but less than 6?

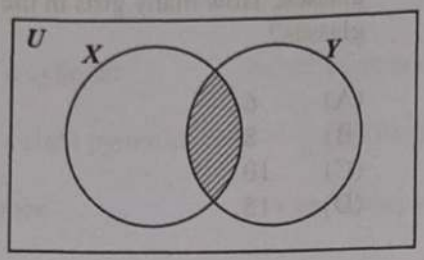
(A) $\{x : -3 > x > 6, x \in Z\}$
(B) $\{x : -3 \geq x \geq 6, x \in Z\}$
(C) $\{x : -3 \leq x \leq 6, x \in Z\}$
(D) $\{x : -3 < x < 6, x \in Z\}$

9. If X and Y are 2 finite sets such that $n(X) = 9$, $n(X \cap Y) = 4$ and $n(X \cup Y) = 15$, then $n(Y)$ is

(A) 5
(B) 6
(C) 10
(D) 12

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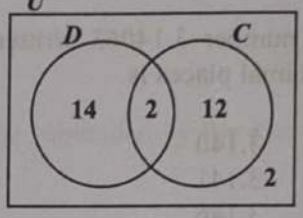
Item **10** refers to the following Venn diagram.

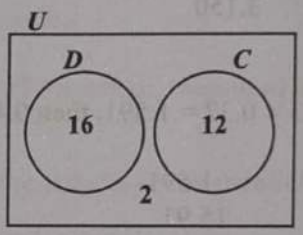


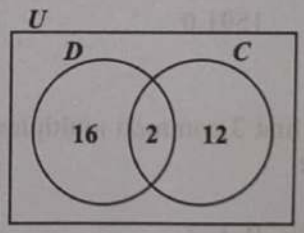
10. In the Venn diagram, X represents the set of factors of 12. Y represents the set of factors of 9. The shaded region represents the set of all factors of

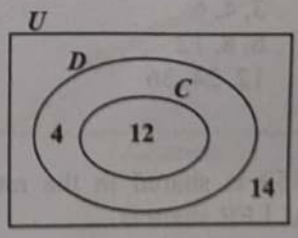
(A) 3
(B) 6
(C) 21
(D) 108

11. The 30 students in Teacher May's class have either a dog (D) or a cat (C), or none of the two. ALL the students who have a cat also have a dog. If $n(C) = 12$ and $n(D) = 16$, which of the following Venn diagrams correctly represents this information?

(A)


(B)


(C)


(D)


12. Which of the following pairs of sets is an example of disjoint sets?

(A) E = {even numbers} and F = {odd numbers}
(B) P = {multiples of 2} and Q = {multiples of 3}
(C) X = {whole numbers} and Y = {rational numbers}
(D) G = {multiples of five} and H = {multiples of ten}

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13. If EC$2.50 is equivalent to US$1.00, then EC$20.00 in US dollars is

(A) $ 5.00
(B) $ 8.00
(C) $50.00
(D) $80.00

14. At a store, 3 cents on every dollar spent is charged as sales tax. How much is paid as sales tax on a costume which costs $196.00?

(A) $ 5.88
(B) $ 17.64
(C) $190.12
(D) $201.88

15. The cash price of a television set is $350. When bought on hire purchase, a deposit of $35 is required, followed by 12 monthly payments of $30. How much is saved by paying cash?

(A) $10
(B) $25
(C) $40
(D) $45

16. A company employs 20 persons as gardeners and clerks. The **mean** daily wage of ALL the employees is $22.40. If EACH of the 12 gardeners is paid $26.00 per day, then the daily amount paid to each of the 8 clerks is

(A) $ 3.60
(B) $17.00
(C) $24.20
(D) $48.40

17. Delano invests $5 000 for 2 years in an investment scheme. The investment earns compound interest of 8% per annum. What will be the amount of Delano's investment at the end of the two-year period?

(A) $ 800
(B) $ 832
(C) $5 800
(D) $5 832

18. A car presently valued at $12 000 depreciates at the rate of 10% per annum. What will be the value of the car one year later?

(A) $10 800
(B) $11 800
(C) $11 880
(D) $13 200

19. A man's basic wage for a 40-hour week is $160.00. He is paid $5.00 per hour for overtime. If he works $6\frac{1}{2}$ hours overtime in a certain week, then his wage for that week is

(A) $165.00
(B) $166.50
(C) $171.50
(D) $192.50

20. A salesman sells a car for $10 500. If he is paid a commission of 5% for the first $10 000 and 8% on the remainder, then the TOTAL commission he receives is

(A) $525
(B) $540
(C) $545
(D) $565

21. Althea normally saves $x each month but in June she saved $4 more than twice her usual amount. In June, she saved

(A) $4x$
(B) $6x$
(C) $2x + 4$
(D) $2(x + 4)$

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22. If $m * n = \sqrt{m^3 - n^2}$, then $5 * 2 =$

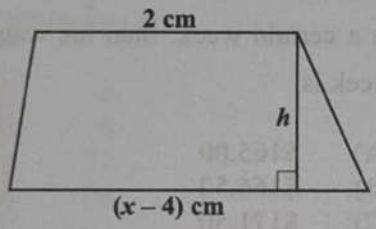
(A) 2

(B) $\sqrt{11}$

(C) $\sqrt{34}$

(D) 11

Item 23 refers to the following diagram of a trapezium.



23. The trapezium with height, h, has an area of x^2 cm^2. The equation that may be used to find the value of x is

(A) $x^2 = \frac{h}{2}(x-2)$

(B) $x^2 = 2h(x-4)$

(C) $x^2 = \frac{h}{2}(x-6)$

(D) $x^2 = h(x-4)(x+2)$

24. $-(-2q) - 3q =$

(A) $-6q$
(B) $-5q$
(C) $-q$
(D) $5q$

25. $5^{n+1} \times 5^{n+2}$ is the same as

(A) 5^{2n}
(B) 5^{2n+3}
(C) $5^{3(2n)}$
(D) 2×5^{2n}

26. If $5(y-2) - 3(y+4) = 0$, then y is

(A) -1
(B) 3
(C) 7
(D) 11

Item 27 refers to the following vectors, p and q.

$$\mathbf{p} = \begin{pmatrix} 3 \\ 7 \end{pmatrix} \quad \mathbf{q} = \begin{pmatrix} -2 \\ 5 \end{pmatrix}$$

27. The vector p – q is represented by

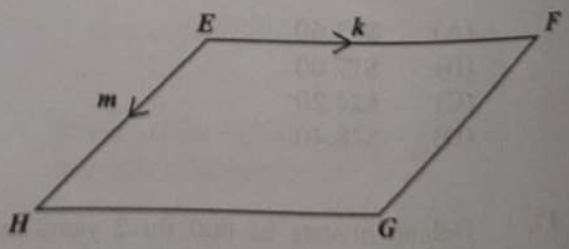
(A) $\begin{pmatrix} 1 \\ 12 \end{pmatrix}$

(B) $\begin{pmatrix} 5 \\ 12 \end{pmatrix}$

(C) $\begin{pmatrix} 5 \\ 2 \end{pmatrix}$

(D) $\begin{pmatrix} 1 \\ 5 \end{pmatrix}$

Item 28 refers to the following diagram of a parallelogram, in which EF is parallel to HG, EH is parallel to FG, $\overrightarrow{EF} = k$ and $\overrightarrow{EH} = m$.



28. $\overrightarrow{EG}$ expressed in terms of k and m is

(A) $k + m$
(B) $k - m$
(C) $m - k$
(D) $-m - k$

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29. If $5\begin{pmatrix} x \\ y \end{pmatrix} = 4\begin{pmatrix} 10 \\ 20 \end{pmatrix}$, then the values of x and y are

(A) $x = 4,\ y = 5$
(B) $x = 8,\ y = 16$
(C) $x = 2.5,\ y = 4$
(D) $x = 10,\ y = 20$

Item **30** refers to the following matrices, A and B.

$$A = \begin{pmatrix} 1 & 3 & -3 \\ 3 & 0 & 5 \end{pmatrix}, \quad B = \begin{pmatrix} 3 & 0 \\ 2 & 1 \\ 0 & 5 \end{pmatrix}$$

30. The matrix product AB is

(A) $\begin{pmatrix} -12 & -6 \\ 25 & 9 \end{pmatrix}$

(B) $\begin{pmatrix} -6 & -12 \\ 9 & 25 \end{pmatrix}$

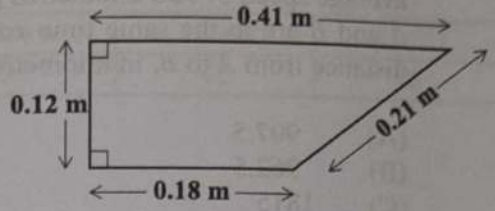
(C) $\begin{pmatrix} 9 & -18 \\ 9 & 25 \end{pmatrix}$

(D) $\begin{pmatrix} 9 & -12 \\ 9 & 25 \end{pmatrix}$

31. If it took a speedboat 9 hours to travel a distance of 1 080 km, what was its average speed, in kmh^{-1}?

(A) 12
(B) 102
(C) 120
(D) 1 200

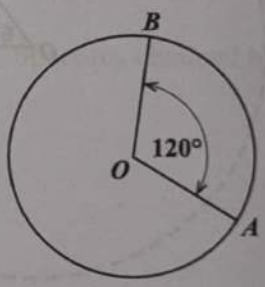
Item **32** refers to the following diagram of a trapezium.



32. The perimeter of the trapezium, in millimetres (mm), is

(A) 0.092
(B) 9.2
(C) 92
(D) 920

Item **33** refers to the following circle, with centre O.



33. If the circumference of the circle is 15 cm, then the length of the minor arc AB, in cm, is

(A) $\frac{360}{120} \times 15$

(B) $\frac{120}{360} \times 15$

(C) $\frac{360}{360 - 120} \times 15$

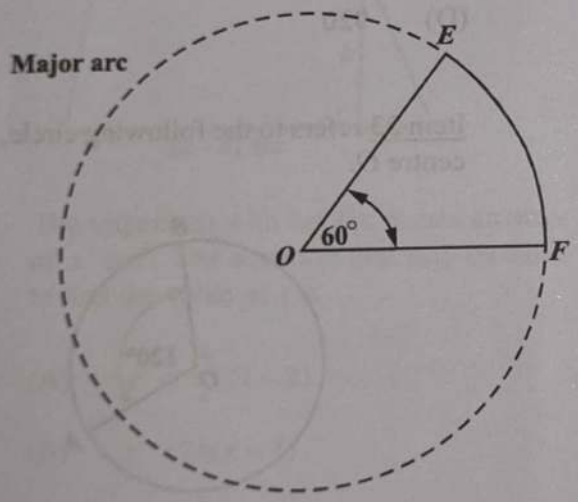
(D) $\frac{360 - 120}{360} \times 15$

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34. An aircraft leaves A at 16:00 hours and arrives at B at 19:30 hours, travelling at an average speed of 550 kilometres per hour. A and B are in the same time zone. The distance from A to B, in kilometres, is

(A) 907.5
(B) 962.5
(C) 1815
(D) 1925

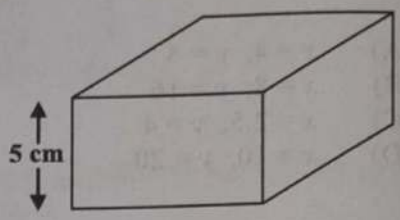
Item 35 refers to the following diagram which shows a circle, with centre O, a sector and the major and minor arcs indicated.



35. The length of the major arc, FE, is 40 cm. What is the circumference of the circle, in cm?

(A) 24
(B) 48
(C) 50
(D) 64

Item 36 refers to the following diagram which shows a cuboid.



36. The volume of the cuboid is 320 cm^3 and the height is 5 cm. If the cuboid has a square base, what is the length of one side of the base?

(A) 8 cm
(B) 16 cm
(C) 32 cm
(D) 64 cm

37. The area of a triangle is 60 cm^2 and its base is 12 cm. What is the perpendicular height of the triangle, in cm?

(A) 5
(B) 10
(C) 13
(D) 17

38. A square has the same area as a rectangle with sides of length 9 cm and 16 cm. What is the length of the side of the square?

(A) 9 cm
(B) 12 cm
(C) 12.5 cm
(D) 75 cm

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Items **39** and **40** refer to the following frequency distribution which shows the average mass, in kg, of a group of children in a school.

Mass (kg)	21–30	31–40	41–50	51–60	61–70
Frequency	15	35	24	40	18

39. The upper limit of the modal class is

(A) 31
(B) 41
(C) 60
(D) 70

40. How many children have a mass GREATER than 40 kg?

(A) 15
(B) 35
(C) 60
(D) 82

Item **41** refers to the following table which shows the frequency of scores obtained by students on a test.

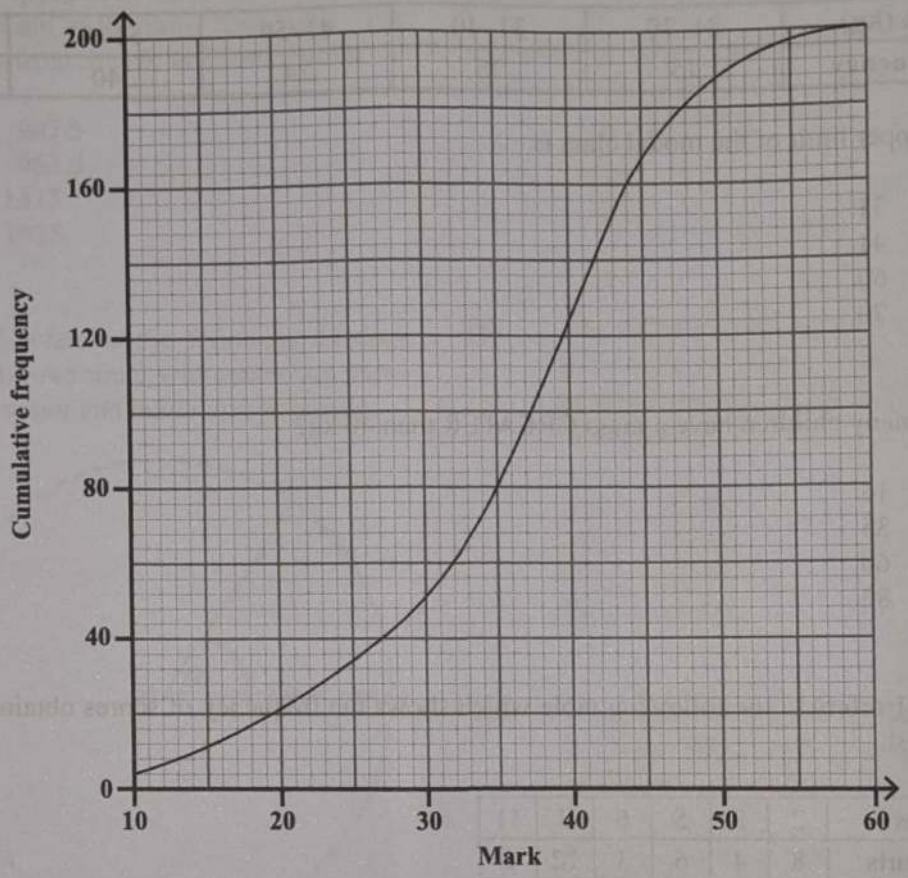
Scores	2	3	5	6	8	11
Students	8	4	6	3	12	2

41. The modal score is

(A) 8
(B) 9
(C) 10
(D) 12

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Item **42** refers to the following diagram of a cumulative frequency curve which shows the marks obtained by 200 students on a test.

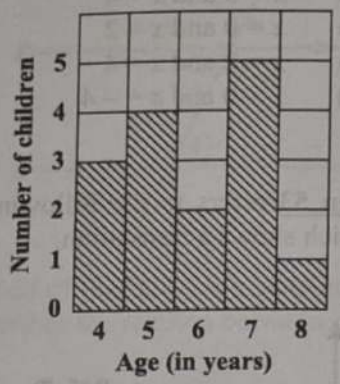


42. The median of the marks scored by the 200 students is

(A) 30.0
(B) 35.0
(C) 37.5
(D) 100.0

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Item 43 refers to the following bar chart which shows the ages of children who took part in a survey.



43. How many children took part in the survey?

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

44. 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) 100
(B) 120
(C) 480
(D) 500

45. Which of the following equations represents a linear function?

(A) $xy = 4$
(B) $y + 4 = x^2$
(C) $y + 3 = 2x$
(D) $y = x^2 + 2x - 5$

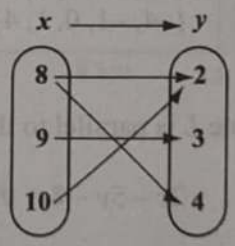
46. The set of ordered pairs below represents a relation that is a function.

$\{(2, 7), (-4, 6), (10, 4)\}$

Which of the following points, when added to the set, would form a relation that is NOT a function?

(A) (2, 8)
(B) (1, 3)
(C) (0, –4)
(D) (–8, 10)

Item 47 refers to the following arrow diagram.



47. The arrow diagram above describes the relation

(A) y is more than x
(B) y is a multiple of x
(C) x is a factor of y
(D) x is a multiple of y

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48. What is the gradient of the straight line $2y = -3x - 8$?

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

49. If $h(x) = \frac{3x-2}{5}$, then $h(-6) =$

(A) -4
(B) $\frac{-16}{5}$
(C) $\frac{16}{5}$
(D) 4

50. The range of $f: x \rightarrow -x^2$ for the domain $\{-2, -1, 0, 1, 2\}$ is

(A) $\{1, 4\}$
(B) $\{-4, -1, 0\}$
(C) $\{-4, -1, 1, 4\}$
(D) $\{-4, -1, 0, 1, 4\}$

51. A line L is parallel to the line

$2x - 5y - 8 = 0$.

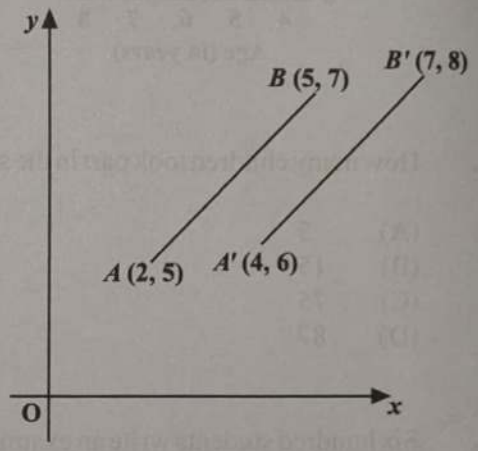
What is the gradient of the line L?

(A) $-\frac{5}{2}$
(B) $-\frac{2}{5}$
(C) $\frac{2}{5}$
(D) 2

52. The values of x at the points where $y = 4x - x^2$ intersects $y = 0$ are

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

Item **53** refers to the following diagram which shows a translation.



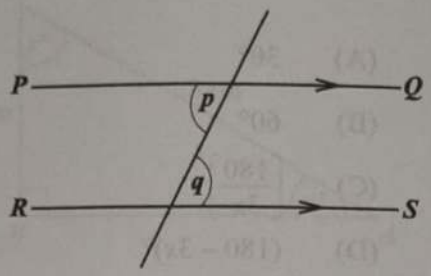
53. In the diagram, the translation by which AB is mapped onto $A'B'$ is represented by

(A) $\begin{pmatrix} 1 \\ 1 \end{pmatrix}$
(B) $\begin{pmatrix} 2 \\ 1 \end{pmatrix}$
(C) $\begin{pmatrix} 3 \\ 2 \end{pmatrix}$
(D) $\begin{pmatrix} 5 \\ 3 \end{pmatrix}$

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Item **54** refers to the following transversal diagram in which PQ and RS are parallel.

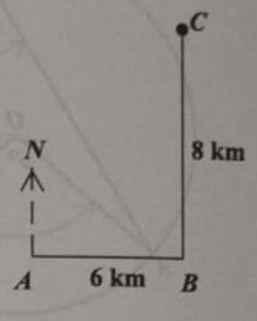


54. Which of the following statements BEST describes the relation between p and q?

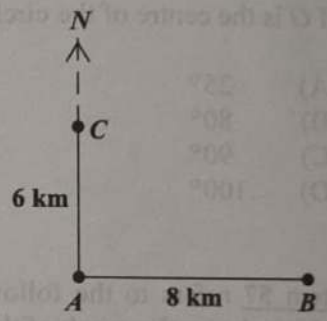
(A) $p = q$
(B) $p < q$
(C) $p + q = 90°$
(D) $p + q = 180°$

55. A ship sailed 8 km due east from A to B. It then sailed 6 km due north to C. Which of the following diagrams BEST represents the path of the ship?

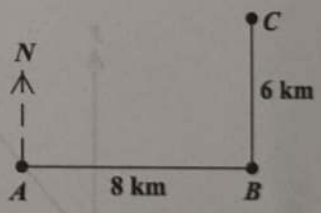
(A)



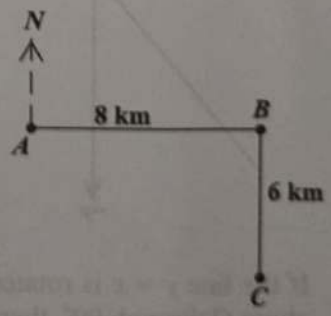
(B)



(C)

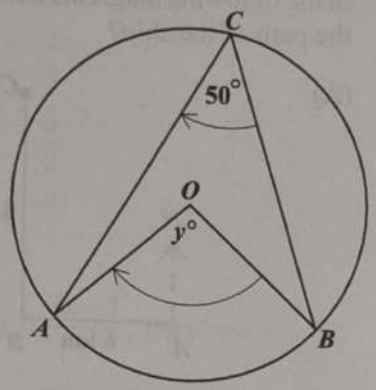


(D)



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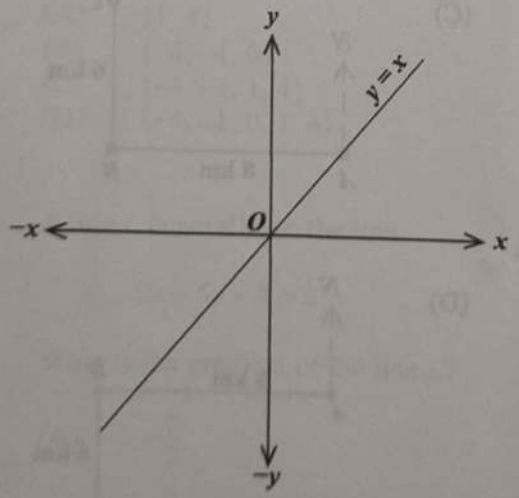
Item 56 refers to the following diagram of a circle.



56. If O is the centre of the circle, then $y°$ is

(A) 25°
(B) 80°
(C) 90°
(D) 100°

Item 57 refers to the following diagram which shows the graph of the line $y = x$.



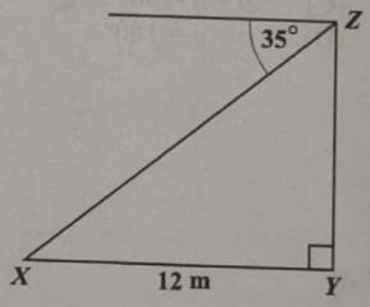
57. If the line $y = x$ is rotated anti-clockwise about O through 90°, then its image is

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

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

(A) 30°
(B) 60°
(C) $\left[\frac{180}{3x}\right]°$
(D) $(180 - 3x)°$

Item 59 refers to the following diagram which shows that the angle of depression of a point X from Z is 35°.

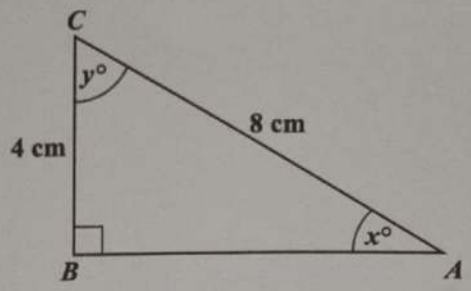


59. If X is 12 metres from Y, then the height, YZ, in metres, is

(A) 12 cos 35°
(B) 12 sin 35°
(C) 12 tan 35°
(D) 12 cos 55°

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Item **60** refers to the following right-angled triangle.



60. Which trigonometric ratio is equal to $\frac{4}{8}$?

(A) $\sin x$
(B) $\tan y$
(C) $\cos x$
(D) $\tan x$

DO NOT WRITE ON THIS PAGE

END OF TEST

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

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