CANDIDATE – PLEASE NOTE!

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

TEST CODE **01234010**

FORM TP 2013091

MAY/JUNE 2013

CARIBBEAN SECONDARY EDUCATION CERTIFICATE®

SECONDARY EDUCATION CERTIFICATE EXAMINATION

MATHEMATICS

Paper 01 – General Proficiency

1 hour 30 minutes

22 MAY 2013 (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

● Ⓑ Ⓒ Ⓓ

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 this 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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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 of a circle $C = 2\pi r$ where r is the radius of the circle.

Arc length $S = \frac{\theta}{360} \times 2\pi r$ where θ^0 is the angle subtended by the arc.

Area of a circle $A = \pi r^2$ where r is the radius of the circle.

Area of a sector of a circle $A = \frac{\theta}{360} \times \pi r^2$ where θ^0 is the angle in 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 $ax^2 + bx + c = 0$,

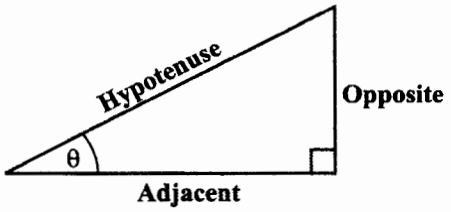
then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Trigonometric ratios

$\sin\theta = \frac{\text{opposite side}}{\text{hypotenuse}}$

$\cos\theta = \frac{\text{adjacent side}}{\text{hypotenuse}}$

$\tan\theta = \frac{\text{opposite side}}{\text{adjacent side}}$

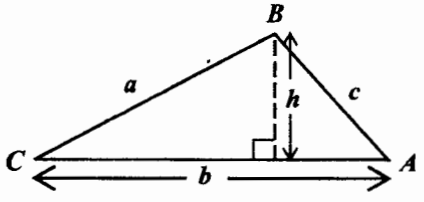


Area of triangle Area of $\Delta ABC = \frac{1}{2} bh$ where b is the length of the base and h is the perpendicular height

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 $a^2 = b^2 + c^2 - 2bc\cos A$

1. $\left(\frac{2}{3}\right)^2$ is equal to

(A) $\frac{4}{6}$

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

(C) $\frac{2}{9}$

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

2. What percentage of 340 is 425?

(A) 80%
(B) 85%
(C) 125%
(D) 152%

3. Ann and Betty shared a sum of money in the ratio 2:3. Ann received \$120. What was Betty's share?

(A) \$ 72
(B) \$ 80
(C) \$180
(D) \$300

4. If $12\frac{1}{2}$% of a sum of money is \$40, what is the TOTAL sum of money?

(A) \$ 45
(B) \$ 320
(C) \$ 500
(D) \$ 4 500

5. The value of 29.94×0.5 is approximately

(A) 0.15
(B) 1.5
(C) 15
(D) 150

6. In a school, the ratio of the number of pupils to the number of teachers is 20 : 1. If the number of pupils is 840, how many teachers are there?

(A) 40
(B) 42
(C) 800
(D) 840

7. The LARGEST prime number that is less than 100 is

(A) 91
(B) 93
(C) 97
(D) 99

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

(A) 1
(B) 3
(C) 12
(D) 60

9. By the distributive law $49 \times 17 + 49 \times 3 =$

(A) $52 + 66$
(B) 52×66
(C) $49 + 20$
(D) 49×20

10. The value of the digit 5 in the number 537 is

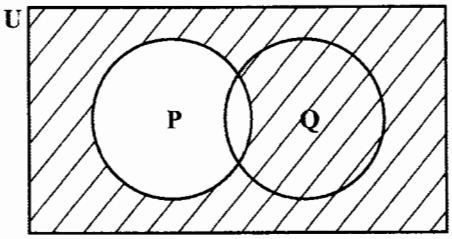
(A) 5
(B) 100
(C) 500
(D) 5 000

11. Which of the following sets is equivalent to $\{a, b, c, d\}$?

(A) { 4 }
(B) $\{a, b, c\}$
(C) $\{p, q, r, s\}$
(D) {1, 2, 3, 4, 5}

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Item **12** refers to the Venn diagram below.



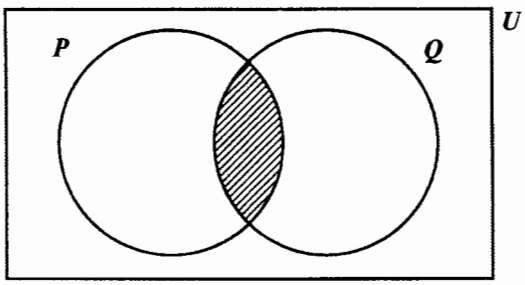
12. In the Venn diagram, the shaded area represents

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

13. If X and Y are two finite sets such that $n(X) = 7$, $n(Y) = 5$ and $n(X \cap Y) = 3$, then $n(X \cup Y)$ is

(A) 6
(B) 9
(C) 15
(D) 18

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



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

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

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. A man's taxable income is $15 200. He pays tax at the rate of 25%. The amount of income tax he pays is

(A) $3 775
(B) $3 800
(C) $3 825
(D) $3 875

17. At the end of any year a car is worth 5% less than what it was worth at the beginning of the year. If a car was worth $10 000 in January 2011, then its value in December 2011 was

(A) $9 995
(B) $9 500
(C) $9 025
(D) $9 000

18. Tom bought a pen for $60 and sold it to gain 20% on his cost price. How much money did he gain?

(A) $12
(B) $40
(C) $72
(D) $80

19. Mr. Duncan bought a table at a discount of 30% thus saving $42. What was the marked price of the table?

(A) $ 98
(B) $110
(C) $140
(D) $182

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20. If the simple interest on \$800 for 3 years is \$54, what is the rate of interest per annum?

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

(B) $2\frac{1}{4}\%$

(C) 5%

(D) 44%

21. At a sale, each book was marked \$3.00 off the original price. Daniel paid \$46.00 for two books that had the same sale price. What was the **original** cost of ONE of his books?

(A) \$20.00
(B) \$21.50
(C) \$24.50
(D) \$26.00

22. If \$7 000 is borrowed at the rate of 5% per annum for 3 years, the simple interest is

(A) \$ 105
(B) \$ 210
(C) \$ 370
(D) \$1 050

23. Seven times the product of two numbers, a and b, may be written as

(A) $7ab$
(B) $49ab$
(C) $7a + b$
(D) $7(a + b)$

24. If x is an integer that satisfies the inequality $4 < 2x \leq 6$, then

(A) $2 < x \leq 3$
(B) $-2 < x \leq 3$
(C) $-3 < x \leq 2$
(D) $-3 \leq x < -2$

25. If $5(2x - 1) = 35$, then $x =$

(A) -4

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

(C) 3

(D) 4

26. $3x^2 \times 2x^3 =$

(A) $6x^5$
(B) $6x^6$
(C) $5x^6$
(D) $72x^5$

27. If $x = 4$ and $y = 2$, what is the value of

$$\frac{x^2 + 3y}{xy}$$

(A) $1\frac{3}{4}$

(B) $2\frac{1}{2}$

(C) $2\frac{3}{8}$

(D) $2\frac{3}{4}$

28. The sum of two positive numbers (p and q) is 32. Their difference is 12. What is the SMALLER number?

(A) 10
(B) 12
(C) 20
(D) 22

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29. 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) $6+\frac{x}{3}=4$

30. The volume of a cube with edge 10 cm is

(A) 30 cm^3
(B) 100 cm^3
(C) 300 cm^3
(D) 1 000 cm^3

31. If $3+\frac{2}{x}=1$, then the value of x is

(A) -1

(B) $\frac{1}{5}$

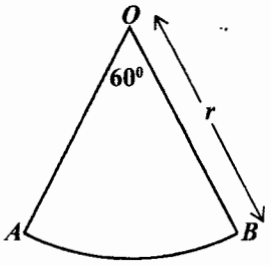
(C) 1

(D) 5

32. How many kilograms are there in one tonne?

(A) 10
(B) 100
(C) 1 000
(D) 10 000

Item 33 refers to the diagram below.



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

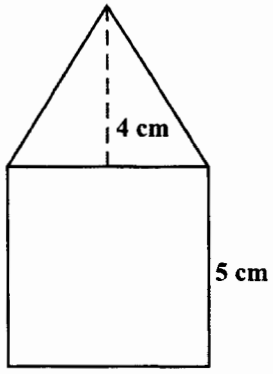
(A) $\frac{1}{6}\pi r^2$

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

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

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

Item 34 refers to the figure below which shows a triangle resting on a square.



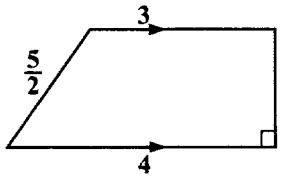
34. The length of one side of the square is 5 cm and the height of the triangle is 4 cm. What is the TOTAL area of the figure, in cm^2?

(A) 35
(B) 45
(C) 50
(D) 100

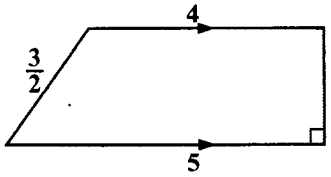
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35. Which of the figures below, **not drawn to scale,** has an area equal to $\frac{1}{2}(5+4) \times 2$ square units?

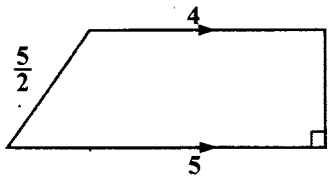
(A)



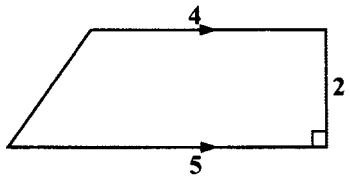
(B)



(C)



(D)



36. A car travels 80 kilometres in $2\frac{1}{2}$ hours. What is its speed in kilometres per hour?

(A) 6
(B) 32
(C) 82.5
(D) 200

37. The area of a rectangle is 53.6 cm². If the length is multiplied by four and the width is halved, the area would then be

(A) 26.8 cm²
(B) 53.6 cm²
(C) 107.2 cm²
(D) 214.4 cm²

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

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

39. The perimeter of a square is 48 cm. What is the area, in cm²?

(A) 36
(B) 72
(C) 108
(D) 144

40. Among a group of employees, the highest paid receives a weekly wage of $105.40. If the range of the wages is $27.50, how much does the LOWEST paid employee receive?

(A) $ 27.50
(B) $ 66.45
(C) $ 77.90
(D) $105.40

Item **41** refers to the information below which shows the scores obtained by eleven footballers in a goal-shoot competition:

5, 3, 6, 8, 7, 8, 3, 11, 6, 3, 2

41. The modal score is

(A) 3
(B) 6
(C) 8
(D) 11

42. A bag contains 2 red, 4 yellow and 6 blue marbles of similar size and shape. The probability of drawing a **blue** marble from the bag at random is

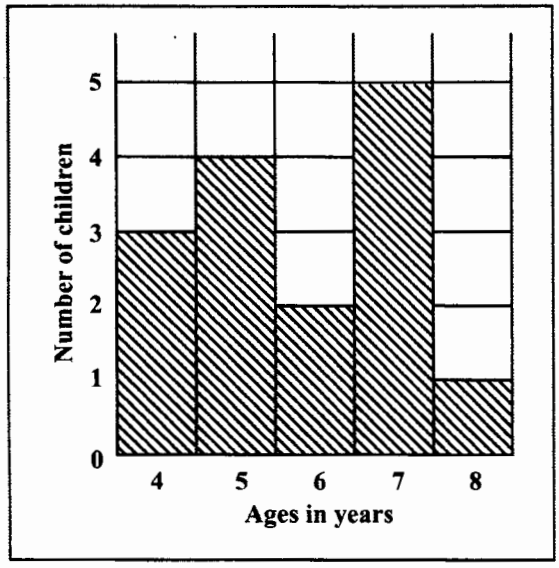
(A) $\frac{1}{6}$

(B) $\frac{1}{3}$

(C) $\frac{1}{2}$

(D) $\frac{6}{11}$

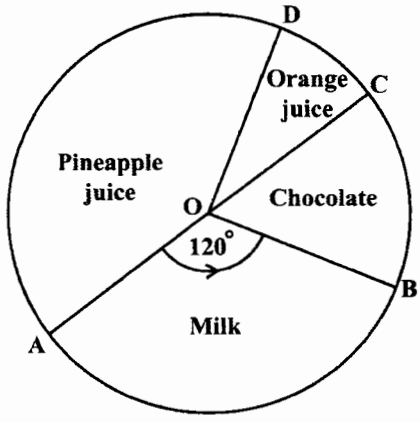
Item **43** refers to the bar chart below which shows the ages of children who took part in a survey.



43. How many children took part in the survey?

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

Item **44** refers to the pie-chart below which shows the preference in drinks of a group of students.



44. If 12 students prefer chocolate, then the TOTAL number of students is

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

45. Of 120 students writing an exam, 100 are expected to pass. The estimated probability that a randomly selected student will FAIL the exam is

(A) $\frac{1}{6}$

(B) $\frac{1}{5}$

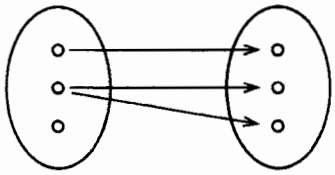
(C) $\frac{1}{2}$

(D) $\frac{5}{6}$

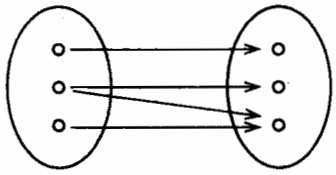
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46. Which of the following diagrams illustrates a function?

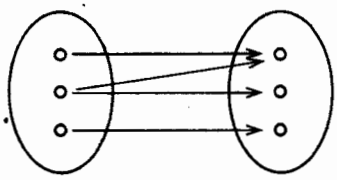
(A)



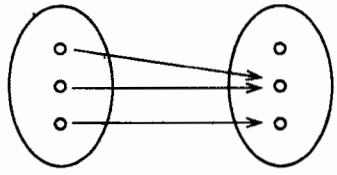
(B)



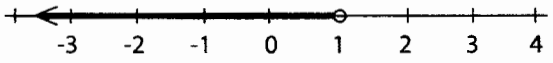
(C)



(D)



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



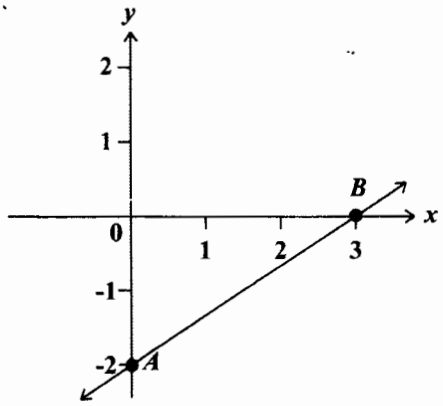
47. The graph of the inequality in the diagram is defined by

(A) $x < 1$
(B) $x > 1$
(C) $x \geq 1$
(D) $x \leq 1$

48. If $f(x) = 2x^2 - 1$, then $f(-3) =$

(A) −32
(B) −19
(C) 17
(D) 35

Item **49** refers to the graph below.



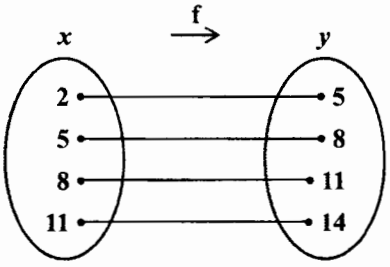
49. The straight line AB cuts the y axis at

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

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

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

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



51. Which of the following statements BEST describes the function?

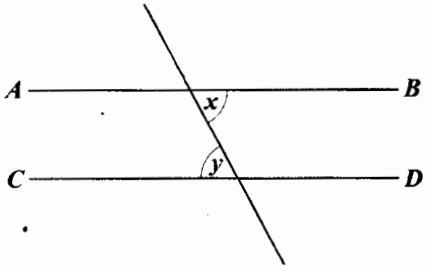
(A) $x = y + 3$
(B) $y = 2x + 1$
(C) $f(x) = 3 - x$
(D) $f(x) = x + 3$

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

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

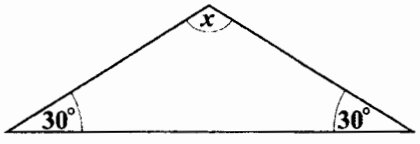
Item 53 refers to the following diagram.



53. In the diagram AB and CD are parallel. Which of the following BEST describes the relation between x and y?

(A) $x = y$
(B) $x > y$
(C) $x + y > 2x$
(D) $x + y < 2x$

Item 54 refers to the triangle below.



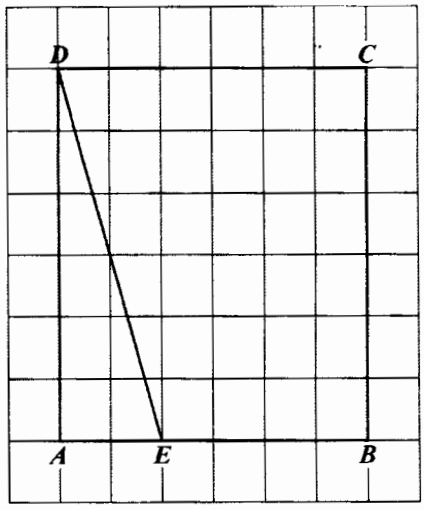
54. In the triangle, the value of x is

(A) 30°
(B) 60°
(C) 120°
(D) 150°

55. 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, 1)
(D) (−1, 3)

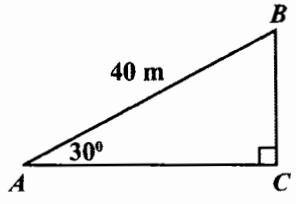
Item 56 refers to the following diagram.



56. How many triangles congruent to Δ ADE would be needed to cover the rectangle ABCD entirely?

(A) 2
(B) 4
(C) 6
(D) 8

Item 57 refers to triangle ABC below.

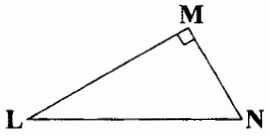


57. In the triangle, **not drawn to scale**, angle $BAC = 30°$ and $AB = 40$ m. The length BC, in metres, is

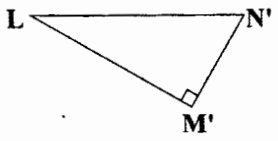
(A) 40 sin 30°
(B) 40 tan 30°
(C) 40 sin 60°
(D) 40 tan 60°

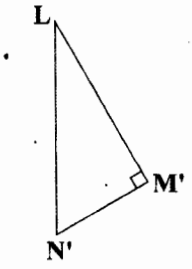
GO ON TO THE NEXT PAGE

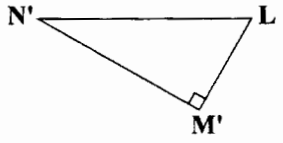
Item **58** refers to the triangle *LMN* below.

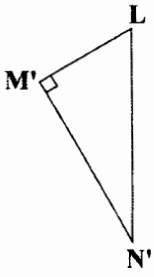


58. Triangle LMN is rotated in a clockwise direction about L through an angle of 90°. What is its image?

(A)


(B)


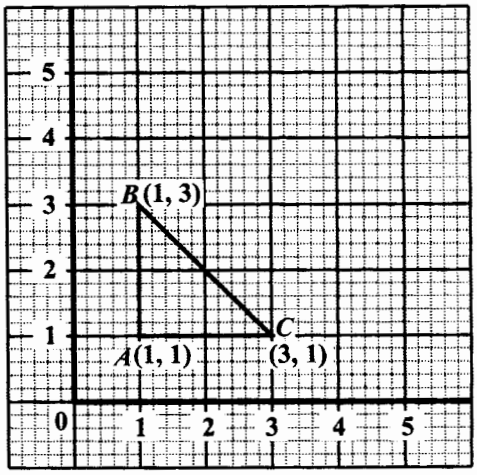
(C)


(D)


59. A plane is flying 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°

Item **60** refers to the following graph.



60. $A'B'C'$ is the image of ABC under an enlargement of scale factor 2. The area of $A'B'C'$, in square units, is

(A) 2
(B) 4
(C) 8
(D) 12

END OF TEST

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