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CANDIDATE PLEASE NOTE
You must sign below and return this booklet with the Answer Sheet. Failure to do so will result in disqualification.
Signature _____

FORM TP 2007104

TEST CODE **01234010**

MAY/JUNE 2007

**CARIBBEAN EXAMINATIONS COUNCIL
SECONDARY EDUCATION CERTIFICATE
EXAMINATION
MATHEMATICS**

Paper 01 – General Proficiency

90 minutes

24 MAY 2007 (p.m.)

READ THE FOLLOWING DIRECTIONS CAREFULLY

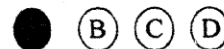
- In addition to this test booklet, you should have an answer sheet.
- Calculators and mathematical tables may NOT be used for this paper.
- A list of formulae is provided on page 2 of this booklet.
- This test consists of 60 items. You will have 90 minutes to answer them.
- Each item in this test has four suggested answers, lettered (A), (B), (C), (D). Read each item you are about to answer, and decide which choice is best.
- On your answer sheet, find the number which corresponds to your item and blacken 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 blackened.

- If you want to change your answer, erase your old answer completely and fill in your new choice.
- 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, omit it and go on to the next one. You can return later to the item omitted. Your score will be the total number of correct answers.
- You may do any rough work in the booklet.
- Do not be concerned that the answer sheet provides spaces for more answers than there are items in this test.

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

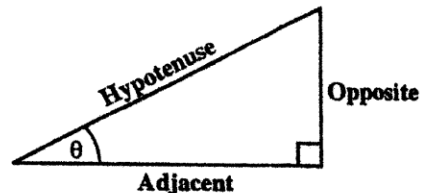
Roots of quadratic equations If $ax^2 + bx + c = 0$,
then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Trigonometric ratios

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

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

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



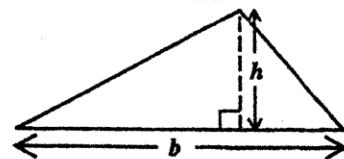
Area of triangle

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

$$\text{Area of } \Delta ABC = \frac{1}{2} ab \sin C$$

$$\text{Area of } \Delta ABC = \sqrt{s(s-a)(s-b)(s-c)}$$

$$\text{where } s = \frac{a+b+c}{2}$$

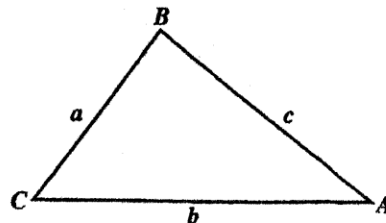


Sine rule

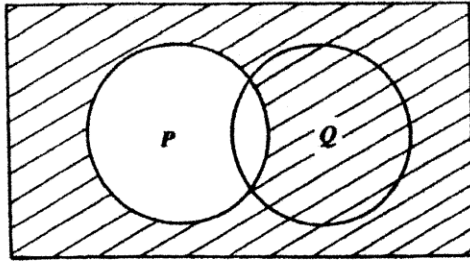
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

Cosine rule

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



1. $(-3)^2 + (-2)^2 =$
- (A) -13
(B) -10
(C) 13
(D) 25
2. How many centimetres are there in 1.5 metres?
- (A) 0.015
(B) 15
(C) 150
(D) 1500
3. Express 0.12 as a fraction in its lowest terms
- (A) $\frac{1}{9}$
(B) $\frac{3}{25}$
(C) $\frac{1}{8}$
(D) $\frac{6}{50}$
4. Express $4\frac{3}{8}$ as a decimal correct to 3 significant figures
- (A) 4.30
(B) 4.37
(C) 4.38
(D) 4.40
5. 3076 in standard form is
- (A) 3.076×10^{-3}
(B) 3.076×10^{-2}
(C) 3.076×10^2
(D) 3.076×10^3
6. If 60% of a number is 90, what is the number?
- (A) 30
(B) 54
(C) 150
(D) 180
7. The H.C.F. of 12, 15 and 60 is
- (A) 1
(B) 3
(C) 12
(D) 60
8. $(\frac{1}{2})^3$ is the same as
- (A) $-\frac{1}{8}$
(B) $-\frac{1}{6}$
(C) $\frac{1}{8}$
(D) $\frac{1}{6}$
9. If $3n$ is an odd number, which of the following is an even number?
- (A) $3n + 2n$
(B) $3n + 2$
(C) $3n - 2$
(D) $3n - 1$
10. The next term in the sequence 1, 6, 13, 22, 33 is
- (A) 44
(B) 45
(C) 46
(D) 52

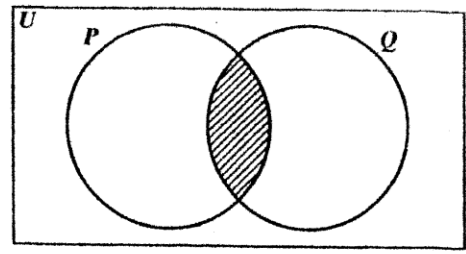


11. In the Venn diagram above, the shaded area represents
- (A) P'
 - (B) $(P \cup Q)'$
 - (C) $Q \cup P'$
 - (D) $Q \cap P'$

12. If $U = \{1, 3, 5, 6, 8\}$ and $A = \{3, 6\}$, then the number of elements in A' is
- (A) 2
 - (B) 3
 - (C) 4
 - (D) 8

13. Which of the following sets is equivalent to $\{a, b, c, d\}$?
- (A) $\{4\}$
 - (B) $\{a, b, c\}$
 - (C) $\{p, q, r, s\}$
 - (D) $\{1, 2, 3, 4, 5\}$

Item 14 refers to the Venn diagram below.



14. In the Venn diagram above, the two circles represent set P and set Q. If $P = \{\text{Factors of 6}\}$ and $Q = \{\text{Factors of 4}\}$, then the shaded region represents
- (A) $\{\}$
 - (B) $\{1, 2\}$
 - (C) $\{4, 6, 8, \dots\}$
 - (D) $\{12, 24, 36, \dots\}$

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 bought a calf for \$200 and sold it for \$250. What was his gain as a percentage of the cost price?
- (A) 5%
 - (B) 15%
 - (C) 20%
 - (D) 25%

17. During a sale, a shop allows 20% discount off the marked price of clothing. What will a customer pay for a dress with a marked price of \$30?
- (A) \$10
 - (B) \$20
 - (C) \$24
 - (D) \$30

Item 18 refers to the table below.

House Insurance	50¢ per \$100
Contents Insurance	25¢ per \$100

18. The above table shows the rates charged by an insurance company. How much will a person pay for his insurance, if his house is valued at \$50 000, and the contents at \$10 000?
- (A) \$225
(B) \$275
(C) \$450
(D) \$500
19. How much does a customer pay for an article marked at \$50.00 if a sales tax of 6% is charged?
- (A) \$44.00
(B) \$47.00
(C) \$53.00
(D) \$56.00
20. Mary invested \$200 for 3 years at 5% per annum. John invested \$300 at the same rate. If they both received the same amount of money in interest, for how many years did John invest his money?
- (A) $1\frac{1}{2}$
(B) 2
(C) 3
(D) 10
21. A company employs 12 gardeners at \$26 per day, and 8 clerks at \$17 per day. What is the mean daily wage, in dollars, of the 20 employees?
- (A) \$20.00
(B) \$21.50
(C) \$22.40
(D) \$31.50
22. A man pays 60 cents for every 200 m³ of gas used, plus a fixed charge of \$13.75. How much does he pay when he uses 55 000 m³ of gas?
- (A) \$151.25
(B) \$165.00
(C) \$175.25
(D) \$178.75
23. $-2(x-4) =$
- (A) $-2x+8$
(B) $-2x+4$
(C) $-2x-4$
(D) $-2x-8$
24. If $a * b = \frac{b}{a} - 1$, then $7 * 28 =$
- (A) $-\frac{3}{4}$
(B) $\frac{1}{4}$
(C) 3
(D) 4
25. $5(2x-y) - 2(3y-5x) =$
- (A) $-11y$
(B) $2x-6y$
(C) $5x-7y$
(D) $20x-11y$
26. For all a and b ,
- $3a(a+2b) - b(2a-3b) =$
- (A) $3a^2+8ab-3b^2$
(B) $3a^2+4ab+3b^2$
(C) $3a^2+4ab-3b^2$
(D) $3a^2-ab+3b^2$

GO ON TO THE NEXT PAGE

27. $\frac{4}{5x} + \frac{2}{5x} =$

(A) $\frac{6}{25x}$

(B) $\frac{8}{25x}$

(C) $\frac{6}{10x}$

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

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

(A) $x \geq 3$

(B) $x > 3$

(C) $x > 6$

(D) $x \geq 6$

29. "When 7 is added to 3 times a certain number n , the result is 22".

The statement above may be represented by the equation

(A) $3n + 7 = 22$

(B) $7n - 22 = 3$

(C) $3n + 22 = 7$

(D) $7n + 3 = 22$

30. Which of the following represents the statement "The difference of two square numbers is positive"

(A) $x^2 - y^2 > 0$

(B) $2x - 2y > 0$

(C) $(y - x)^2 > 0$

(D) $2(y - x) > 0$

31. If $a = 3$ and $ab = 6$, then $(a + b)^2 - a^2 - b^2 =$

(A) 0

(B) 8

(C) 12

(D) 20

32. The volume of a cube with edges 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. The lengths of the sides of a triangle are x , $2x$ and $2x$ centimetres. If the perimeter is 20 centimetres, what is the value of x ?

(A) 10

(B) 8

(C) 5

(D) 4

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

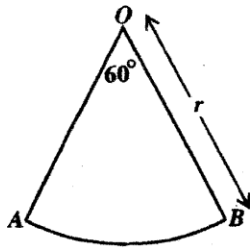
(A) 6

(B) 32

(C) 82.5

(D) 200

Item 36 refers to the diagram below.



36. AOB is a sector of a circle such that angle $AOB = 60^\circ$ 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) $\frac{1}{6} \pi r^2$

37. Fifty guests each had 2 glasses of champagne. Each glass held 150 millilitres. How many litres of champagne were used?

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

38. The area of a rectangle is 53.6 cm^2 . If the length is multiplied by four and the width is halved, the area would then be

- (A) 26.8 cm^2
 (B) 53.6 cm^2
 (C) 107.2 cm^2
 (D) 214.4 cm^2

39. 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} , how many km is his home from school?

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

40. The marks obtained by ten students in a test marked out of 25 were:

14, 22, 15, 19, 19, 16, 24, 13, 20, 19

The range of marks was

- (A) 11
 (B) 13
 (C) 18
 (D) 19

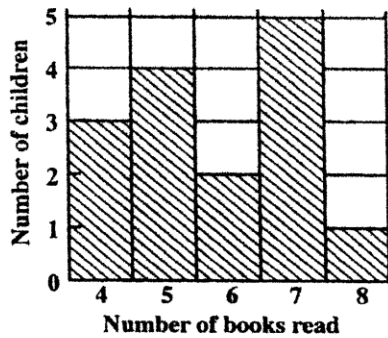
Item 41 refers to the following table.

Mark	Frequency	Mark \times Frequency
1	2	2
2	3	6
3	5	15
4	4	16
5	x	y
Total		49

41. The table shows the frequency distribution of the marks a student obtained on a test. How often did the student score 5 marks?

- (A) 2
 (B) 5
 (C) 10
 (D) 49

Item 42 refers to the following bar chart.



42. 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

Item 43 refers to the following table..

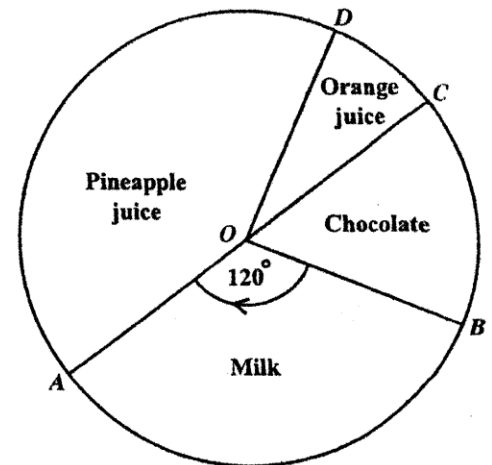
Length of Leaf (cm)	10–14	15–19	20–24	25–29
Frequency	3	8	12	7

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

The class boundaries are

- (A) 3, 18, 12, 7
(B) 5, 5, 5, 5
(C) 10, 14, 15, 19, 20, 24, 25, 29
(D) 9.5, 14.5, 19.5, 24.5, 29.5

Item 44 refers to the pie-chart below.



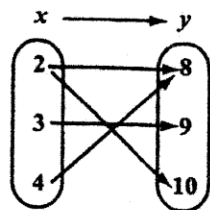
44. The pie-chart above shows the preference in drinks of a group of students. If 12 students prefer chocolate, then the total number of students is

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

45. A boy throws a die twice. What is the probability that he will get a three followed by an even number?

- (A) $\frac{1}{12}$
(B) $\frac{1}{4}$
(C) $\frac{5}{12}$
(D) $\frac{7}{12}$

Item 46 refers to the arrow diagram below. 49.



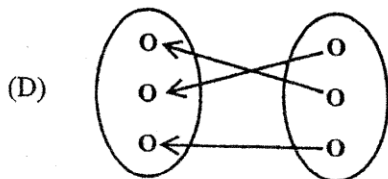
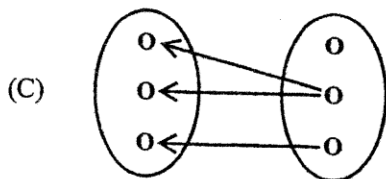
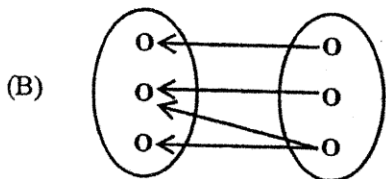
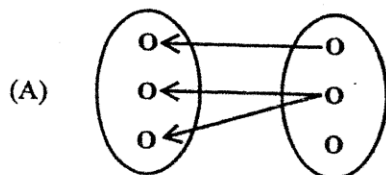
46. The arrow diagram above describes the relation

- (A) x is a factor of y
- (B) x is less than y
- (C) x is a multiple of y
- (D) x is greater than y

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

- (A) -31
- (B) 29
- (C) 24
- (D) 31

48. Which of the following diagrams illustrates a function?

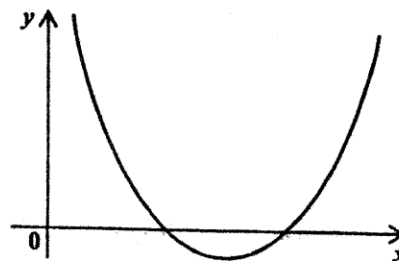


1 5 5 11 9 8 5

The median of the set of numbers above is

- (A) 5
- (B) 6
- (C) 8
- (D) 9

Item 50 refers to the following diagram.



50. The diagram above shows a graph. If a , b and c are constants, the equation of the graph could be

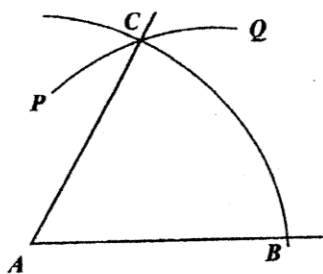
- (A) $y = ax^2 + c$
- (B) $y = c - ax^2$
- (C) $y = c + bx - ax^2$
- (D) $y = ax^2 + bx + c$

51. Which of the following sets is represented by the relation $f: x \rightarrow x^2 + 3$?

- (A) $\{(0, 3), (1, 4), (2, 7), (3, 12)\}$
- (B) $\{(0, 3), (1, 5), (2, 7), (3, 9)\}$
- (C) $\{(0, 3), (1, 4), (2, 5), (3, 6)\}$
- (D) $\{(0, 3), (1, 1), (2, 4), (3, 9)\}$

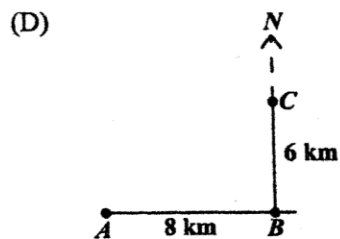
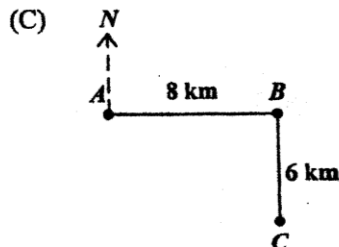
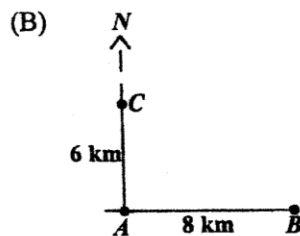
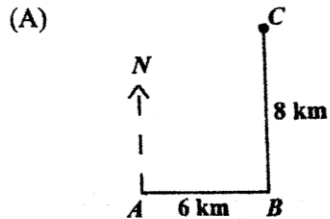
52. A boat was travelling on a bearing of 270° . In what direction is it travelling?
- (A) West
(B) East
(C) North
(D) South

Item 53 refers to the diagram below of a construction. With centre A , an arc BC is drawn. With centre B , and the same radius, the arc PCQ is drawn.

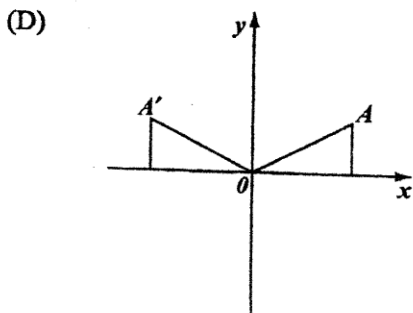
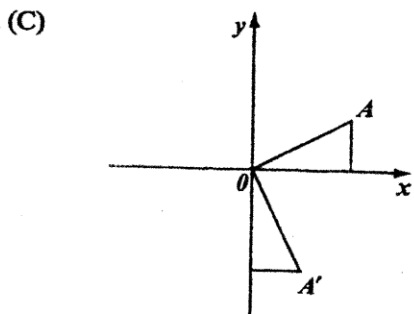
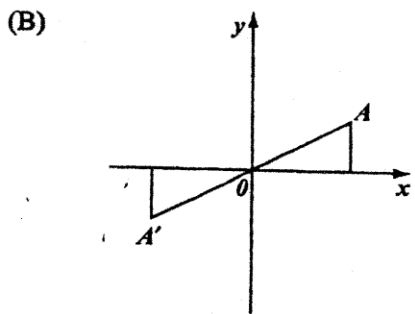
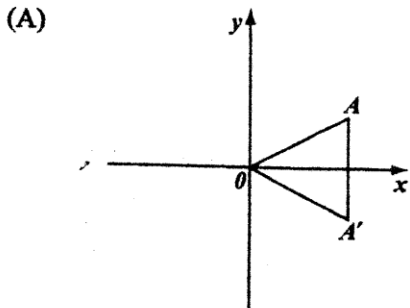


53. What is the measure of $\angle BAC$?
- (A) 30°
(B) 45°
(C) 60°
(D) 75°

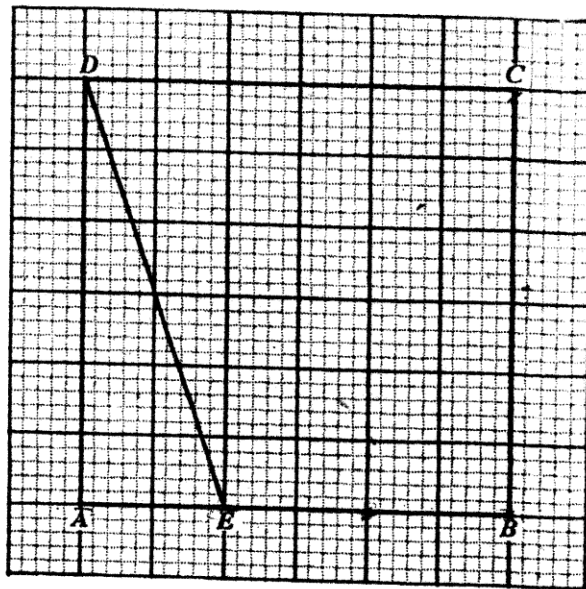
54. A ship sailed 8 km due east from A to B . It then sailed 6 km due north to C . Which diagram below BEST represents the path of the ship?



55. In each of the diagrams shown below, A' is the image of A . Which of the diagrams shows a reflection in the x -axis?



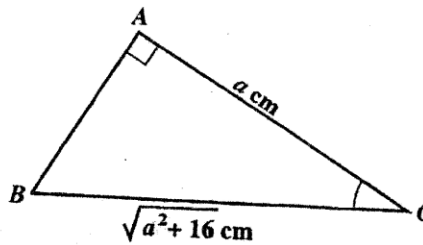
Item 56 refers to the following diagram.



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

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

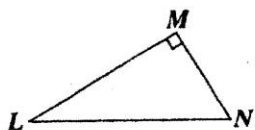
Item 57 refers to the following diagram.



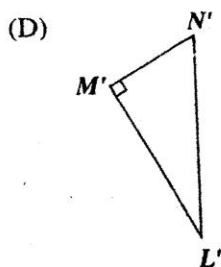
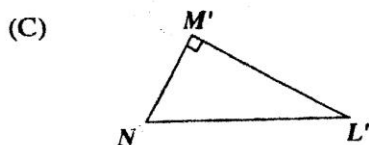
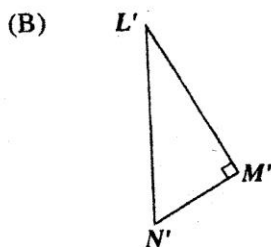
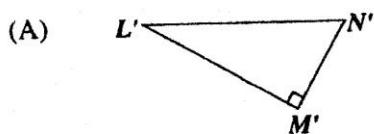
57. The length, in cm, of AB is

- (A) 4
(B) a
(C) $a + 4$
(D) $a - 4$

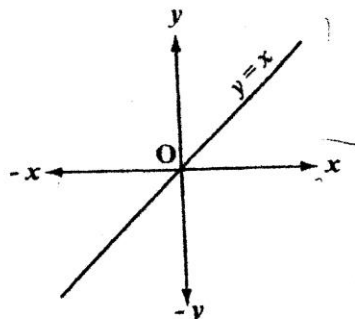
58.



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



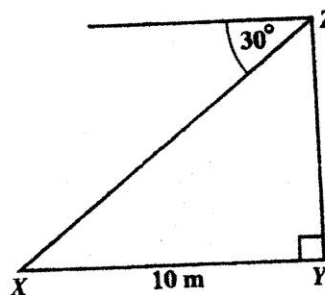
Item 59 refers to the following diagram.



59. 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) $y = -x$

Item 60 refers to the diagram below.



60. The diagram above, **not drawn to scale**, shows 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) $10 \tan 30^\circ$
- (B) $10 \sin 30^\circ$
- (C) $10 \cos 30^\circ$
- (D) $10 \cos 60^\circ$

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