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.

_____

FORM TP 2015088

TEST CODE **01234010**

MAY/JUNE 2015

CARIBBEAN SECONDARY EDUCATION CERTIFICATE®
SECONDARY EDUCATION CERTIFICATE EXAMINATION

MATHEMATICS

Paper 01 – General Proficiency

1 hour 30 minutes

20 MAY 2015 (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 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 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 (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.

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 $ax^2 + bx + c = 0$,

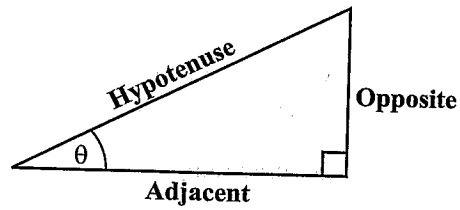
then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Trigonometric ratios

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

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

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

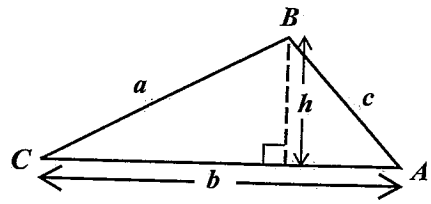


Area of triangle — Area of $\Delta ABC = \frac{1}{2}bh$ where b is the length of the base and h is the perpendicular height

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 — $\frac{a}{SinA} = \frac{b}{SinB} = \frac{c}{SinC}$

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

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1. $(-3)^2 + (-2)^2$ is equal to

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

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

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

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. $11.1 \div 0.01$ is equal to

(A) 110
(B) 111
(C) 1 100
(D) 1 110

5. A test was marked out of 80. A boy scored 60% of the marks on the test. How many marks did he score?

(A) 20
(B) 48
(C) 60
(D) 75

6. If 30% of a number is 45, what is the number?

(A) 30
(B) 54
(C) 150
(D) 180

7. What is the value of the digit 6 in the number 48.061?

(A) $\frac{6}{100}$
(B) $\frac{6}{10}$
(C) 6
(D) 600

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

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

9. Using the distributive property
$49 \times 17 + 49 \times 3 =$

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

10. The next term in the sequence

1, 6, 13, 22, 33, _____, . . . is

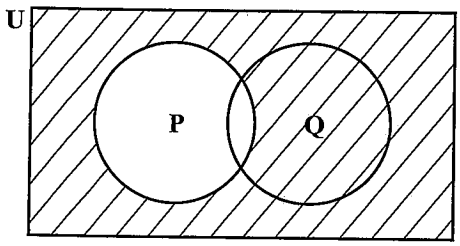
(A) 44
(B) 45
(C) 46
(D) 52

11. Given that $P = \{2, 3, 5, 6\}$ and $Q = \{2, 3, 4\}$ then P $\cup$ Q is described as

(A) $\{x: 1 \leq x < 7; x \in N\}$
(B) $\{x: 1 < x < 7; x \in N\}$
(C) $\{x: 2 \leq x < 6; x \in N\}$
(D) $\{x: 2 < x < 6; x \in N\}$

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



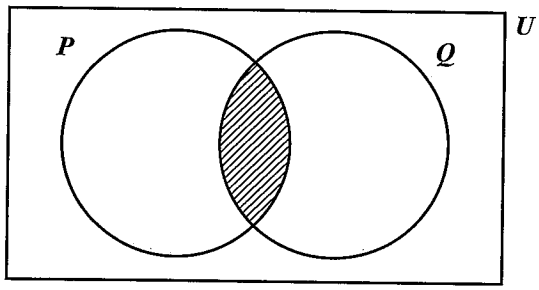
12. In the Venn diagram, the shaded area represents

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

13. In a group of 40 students, 28 play tennis and 22 play chess. What is the LEAST number of students who play BOTH tennis and chess?

(A) 6
(B) 10
(C) 12
(D) 18

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. Mrs Jones' taxable income is \$18 400. She pays tax at a rate of 20%. The amount of income tax she pays is

(A) \$9 200
(B) \$4 600
(C) \$3 680
(D) \$1 472

16. The value of a plot of land is \$18 000. Land tax is charged at the rate of \$0.70 per \$100 value. What is the TOTAL amount of tax paid for the land?

(A) \$110.00
(B) \$126.00
(C) \$180.70
(D) \$257.15

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 certain car was worth \$10 000 at the beginning of 2014, then its value at the end of 2014 was

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

18. A man bought a mobile phone for \$800 and sold it for \$1 000. What was his profit as a percentage of the cost price?

(A) 5 %
(B) 15 %
(C) 20 %
(D) 25 %

19. Susan bought a calculator for \$120. She had to pay sales tax of 10% on the price. How much change would she receive from \$140?

(A) \$ 8
(B) \$12
(C) \$28
(D) \$32

20. The simple interest on a loan of \$6 000 for 3 years was \$900. What was the rate of interest per annum?

(A) 2%
(B) 3%
(C) 5%
(D) 18%

21. A dress which costs \$180 is being sold at a discount of 10%. The amount of the discount is

(A) \$ 1.80
(B) \$ 10.00
(C) \$ 18.00
(D) \$170.00

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

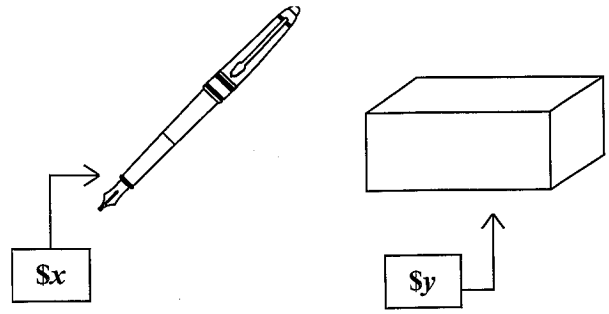
23. $-2(x-4) =$

(A) $-2x+8$
(B) $-2x+4$
(C) $-2x-4$
(D) $-2x-8$

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) $-3 \leq x < -2$

Item **25** refers to the information below which shows the cost of a pen and a box.



25. The total cost of 3 pens and 2 boxes is

(A) $5xy$
(B) $5(x+y)$
(C) $2x+3y$
(D) $3x+2y$

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

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

27. $P = \dfrac{m^2}{2-m}$. When $m = -3$, the value of P is

(A) -6
(B) $\dfrac{-6}{5}$
(C) $\dfrac{9}{5}$
(D) 9

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

(A) $-\dfrac{3}{4}$
(B) $\dfrac{1}{4}$
(C) 3
(D) 4

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29. If $5x - 26 = x + 50$, then the value of x is

(A) -12
(B) -6
(C) 6
(D) 19

30. John has x marbles and Max has twice as many. Max gives John 5 of his marbles. How many marbles does Max now have?

(A) $x + 5$
(B) $x - 5$
(C) $2x - 5$
(D) $2x + 5$

31. When 8 is subtracted from a certain number and the result is multiplied by 3 the answer is 21. What is the **original** number?

(A) 1
(B) 3
(C) 10
(D) 15

32. 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

33. A car travels 80 kilometres in 2½ hours. What is its speed in kilometres per hour?

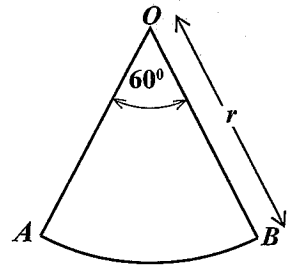
(A) 6.5
(B) 32.0
(C) 82.5
(D) 200.0

34. Given that 1 millimetre = $\frac{1}{1000}$ metres,

express 2 500 millimetres in metres.

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

Item **35** refers to the diagram below.



35. 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) $\frac{1}{3}\pi r$

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

(A) 88π
(B) 176π
(C) $\frac{88}{\pi}$
(D) $\frac{88}{2\pi}$

37. A man leaves home at 22:15 hours and reaches his destination at 04:00 hours 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) $6\frac{1}{4}$

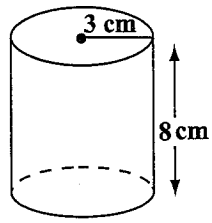
38. The area of a triangle is 30 cm² and its base is 10 cm. What is the height, in cm, of the triangle?

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

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

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

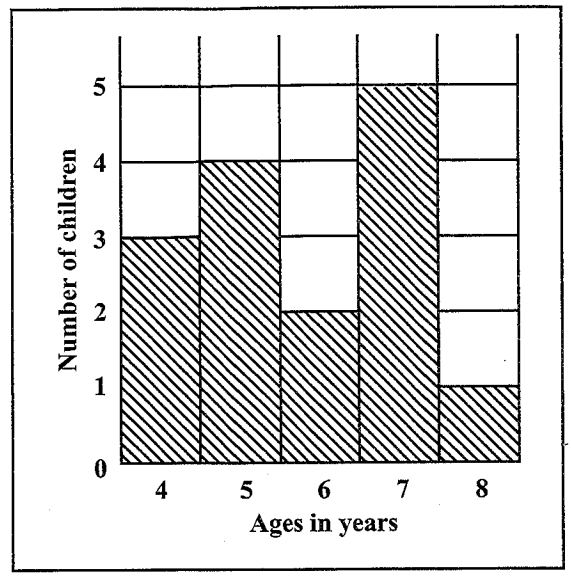
Item **40** refers to the diagram below.



40. The diagram, **not drawn to scale**, shows a cylinder of radius 3 cm and height 8 cm. The volume is

(A) 12π cm³
(B) 48π cm³
(C) 72π cm³
(D) 192π cm³

Items **41–42** refer to the histogram below which shows the number of children aged 4, 5, 6, 7 and 8 who took part in a survey.



41. What was the modal age?

(A) 5
(B) 6
(C) 7
(D) 8

42. How many children took part in the survey?

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

43. Jade's scores on her nine spelling tests are 5, 7, 7, 4, 5, 4, 7, 6, 6.
Therefore, her median score on these nine tests is

(A) 4
(B) 5
(C) 6
(D) 7

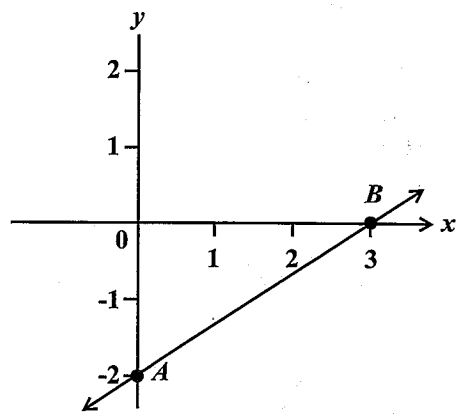
44. If the mean of the four numbers 4, 8, x and 12 is 10, then x is

(A) 4
(B) 10
(C) 12
(D) 16

45. The boundaries of the class interval 10 – 14 are BEST recorded as

(A) $10 \leq x \leq 14$
(B) $9.5 < x < 14$
(C) $9.5 \leq x < 14.5$
(D) $10 \leq x \leq 14.5$

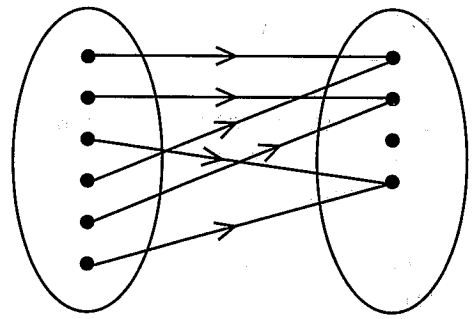
Item **46** refers to the graph below.



46. The straight line AB cuts the x-axis at

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

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



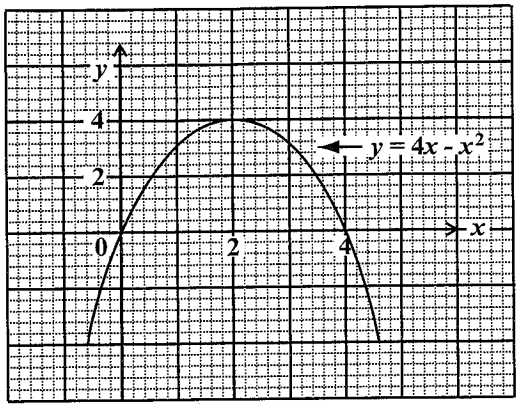
47. The relationship that BEST describes the mapping shown in the diagram is

(A) one-to-one
(B) many-to-one
(C) one-to-many
(D) many-to-many

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

(A) –32
(B) –19
(C) 17
(D) 35

Items **49–50** refer to the graph below.



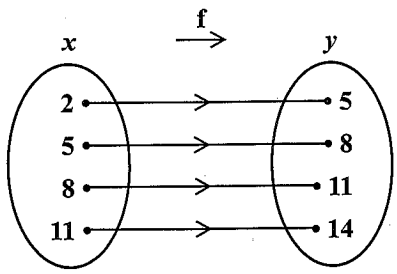
49. The maximum point of $y = 4x - x^2$ is

(A) (0, 0)
(B) (0, 4)
(C) (4, 2)
(D) (2, 4)

50. 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) $x = 0$ and $x = -4$
(D) $x = 2$ and $x = 4$

Item **51** refers to the arrow diagram below, which shows a function.



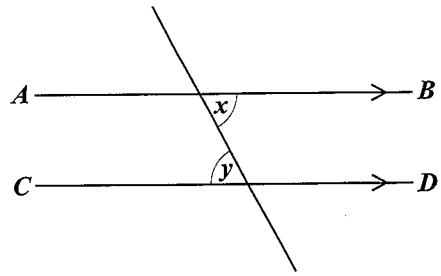
51. Which of the following BEST describes the function?

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

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

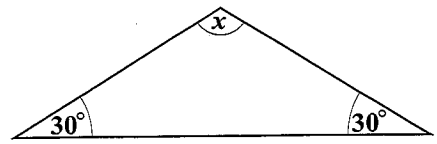
Item **53** refers to the following diagram.



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

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

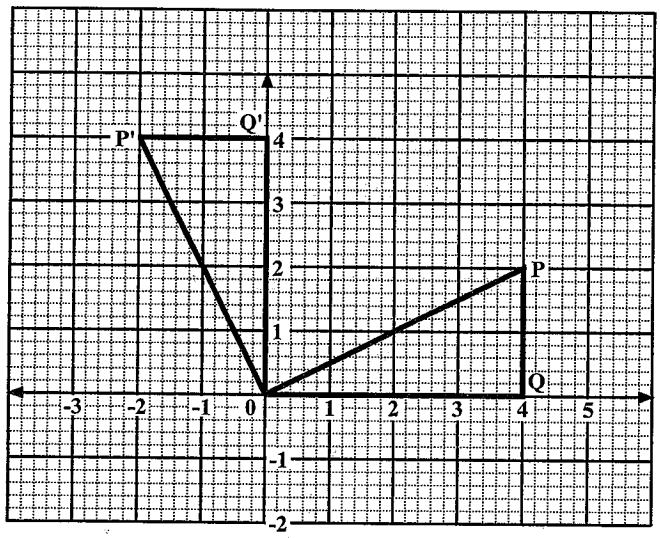
Item **54** refers to the triangle below.



54. In the triangle, the value of x is

(A) 30°
(B) 60°
(C) 120°
(D) 150°

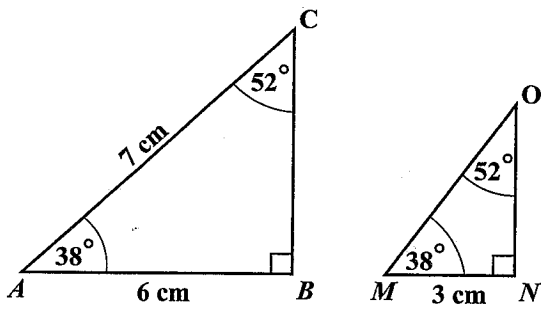
Item **55** refers to the diagram below.



55. In the diagram, ΔOPQ is mapped onto $\Delta OP'Q'$. What type of transformation has taken place?

(A) Reflection
(B) Enlargement
(C) Translation
(D) Rotation

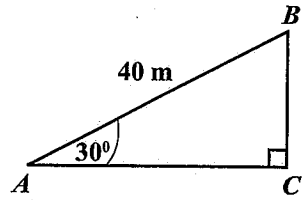
Item **56** refers to the following pair of similar triangles.



56. The length of MO, in centimetres, is

(A) 3
(B) 3.5
(C) 6
(D) 7

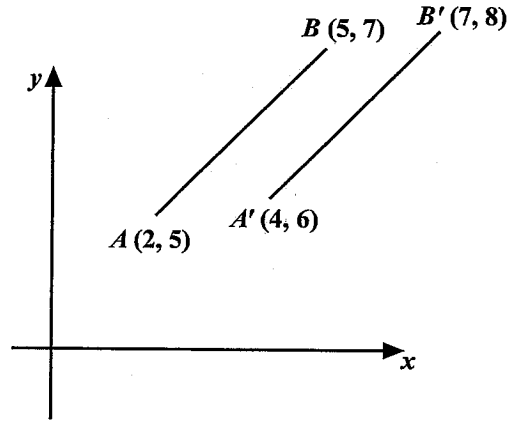
Item **57** refers to triangle ABC below.



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°

Item **58** refers to the diagram below.



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

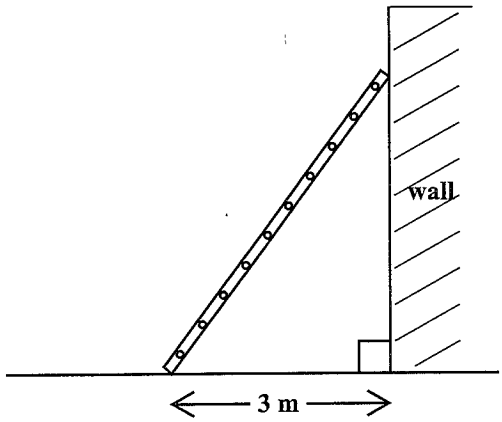
(A) $\begin{pmatrix} 1 \\ 1 \end{pmatrix}$

(B) $\begin{pmatrix} 2 \\ 1 \end{pmatrix}$

(C) $\begin{pmatrix} 3 \\ 2 \end{pmatrix}$

(D) $\begin{pmatrix} 5 \\ 3 \end{pmatrix}$

Item **59** refers to the diagram below which shows a ladder 5 metres long leaning against a vertical wall. The foot of the ladder is on horizontal ground about 3 metres away from the wall.

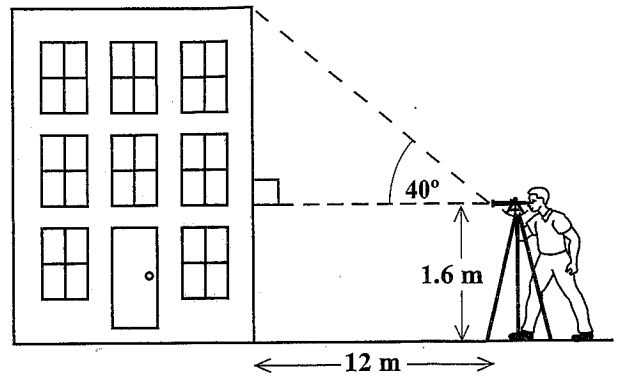


59. How far up the wall does the ladder reach?

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

Item **60** refers to the diagram of a building below.

A surveyor sets up his instruments 12 metres from the foot of a building, and records the angle of elevation of the top of the building.



60. An estimate of the height of the building is obtained by calculating

(A) 12 tan 40°
(B) 12 sin 40°
(C) 1.6 + 12 cos 40°
(D) 1.6 + 12 tan 40°

END OF TEST

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