JUNIOR LYCEUMS ANNUAL EXAMINATIONS - 2001

Educational Assessment Unit - Education Division

FORM III **MATHEMATICS (MENTAL)** **TIME: 15 minutes**

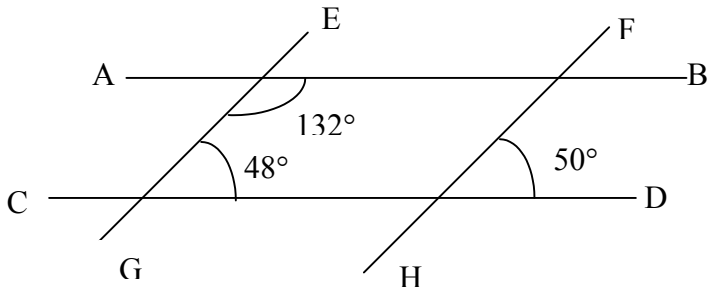
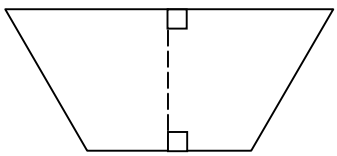
Name _____

Class _____

Mark

- **ANSWER ALL QUESTIONS.**
- **EACH QUESTION CARRIES 1 MARK.**
- **CALCULATORS, RULERS, PROTRACTORS AND OTHER MATHEMATICAL INSTRUMENTS ARE NOT ALLOWED.**
- **WRITE DOWN YOUR ANSWER ONLY IN THE SPACE PROVIDED.**

DO NOT WRITE IN THIS SPACE

QUESTION	ANSWER
1. What is three fourths of sixteen equal to?	
2. Write in ascending order : 12^3, 12^2, 12^0, 12^1 .	
3. **`REPEAT 6 [FD 50 RT 60]`** What shape does the LOGO turtle draw with these commands?	
4.  Name two parallel lines from the diagram.	
5. What is the gradient of the line with equation $2y = 4x + 5$?	
6. Write 3 : 2 in the form n : 1.	
7. In a quadrilateral ABCD it is only known that AB = CD = 8 cm and AD = BC = 5 cm. The quadrilateral must be: a) a rectangle b) a square c) a parallelogram d) a rhombus.	
8. A television set costs Lm300 without VAT. What is the cost of the television set when VAT at 15% is paid on it?	
9. A field of grass feeds 36 cows for 12 days. How long would the same field feed 72 cows?	
10. The area of the trapezium is given by the formula $\frac{1}{2}h(a+b)$. Label the figure with the letters a, b, and h. 	

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FORM 3 **MATHEMATICS (Main Paper)** **TIME: 1 h 45 min**

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total Main	Mental	**Global Mark**
Mark																		

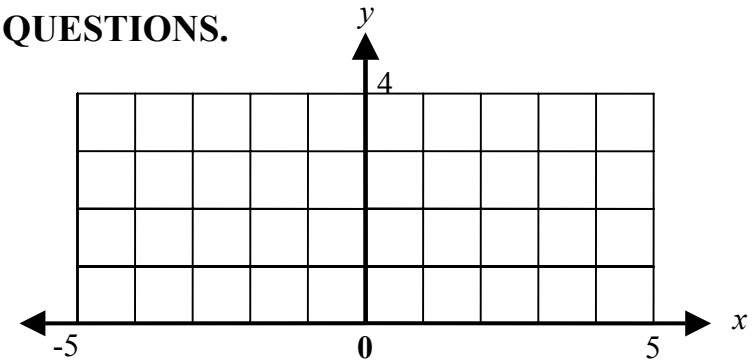
DO NOT WRITE ABOVE THIS LINE

Name _____ Class _____

CALCULATORS ARE ALLOWED BUT ALL NECESSARY WORKING MUST BE SHOWN

ANSWER ALL QUESTIONS.

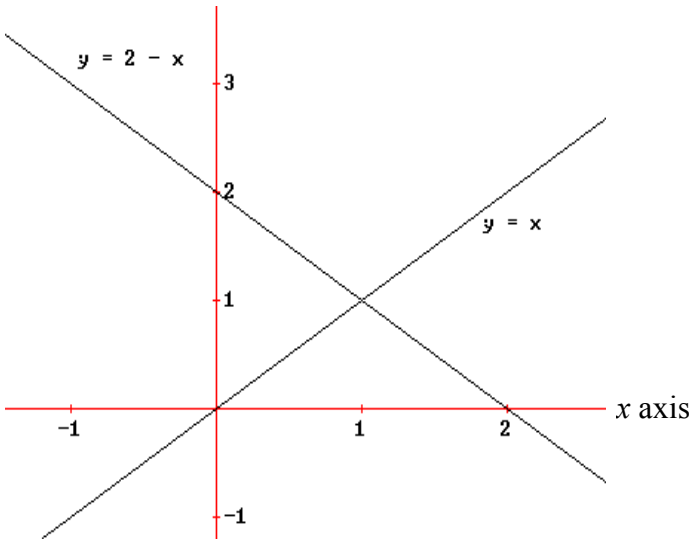
1.



Plot the points A(-2,4), B(3,4), C(0,0), D(-5,0) and join them up in alphabetical order to form a closed shape. Find, in square units, the area of the shape ABCD.

_____(4marks)

2.



Write down:

(a) the *y*-intercept of the line with equation y = 2 – *x*.

(b) From the graph solve the simultaneous equations:
y = 2 – *x*
y = *x*

_____(4marks)

3. (a) A bank pays interest at the rate of 2% annually. What is the interest payable after one year on Lm5000?

(b) Another bank pays Lm200 interest in one year on Lm5000. What is the annual rate of interest?

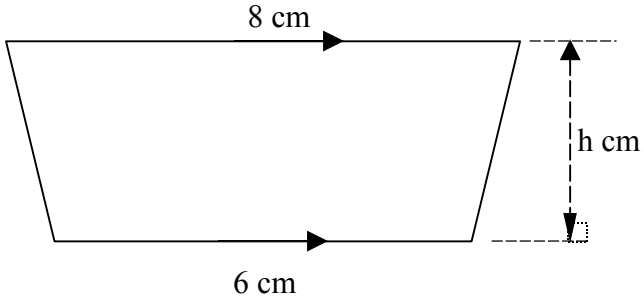
_____(4marks).

4. (a) If $r = \frac{6}{s+t}$ find r when $s = 1^1/_4$ and $t = {}^1/_4$.

(b) Make w subject of the formula $x = 2w + y$.

_____(4marks)

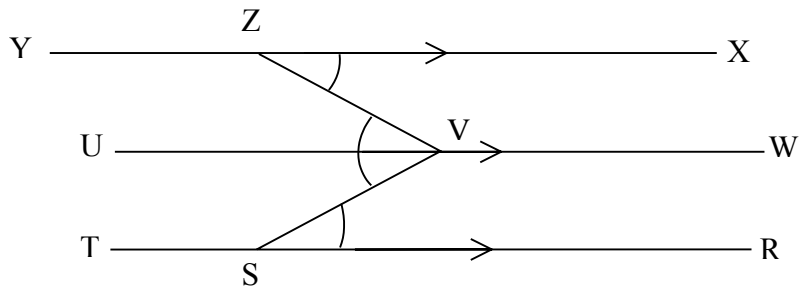
5.



The area of the trapezium is 21cm^2.
Work out the height of the trapezium.

_____(4marks)

6.



Explain why $\angle ZVS = \angle XZV + \angle RSV$.

_____(6marks)

7. A group of 150 students were asked how much pocket money they received every month.

The results are shown in the table below.

Pocket money in Lm	0 — 9	10 — 19	20 — 29	30 — 39	40 — 49	50 — 59
No of students	35	50	30	20	10	5

(a) On the graph paper provided draw a histogram representing the above information. On the vertical axis use a scale of 1cm for every 5 students.

(b) What is the probability that a student picked at random from the above group will have Lm10 to Lm19 pocket money?

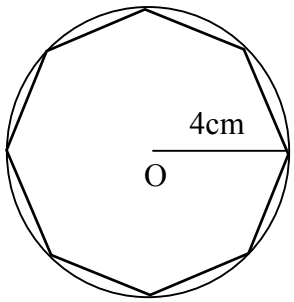
_____(6marks)

8. Simplify the following expressions:

(a) $\frac{2}{x} \times \frac{8x^3}{2^3}$ (b) $\frac{x+3}{3} - \frac{x-2}{6}$ (c) The answer to $2.1\times10^3 \times 3\times10^{-2}$ is $x \times 10^y$ in standard form. What are the values of x and y?

_____(6marks)

9.

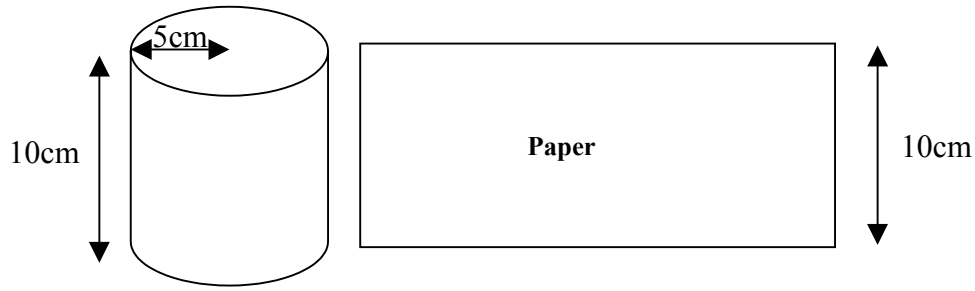


Construct a regular octagon, as shown in the diagram, in a circle centre O and radius 4cm.
Measure and write down the length of one side of the octagon correct to one decimal place.

•O

_____ (6marks)

10.

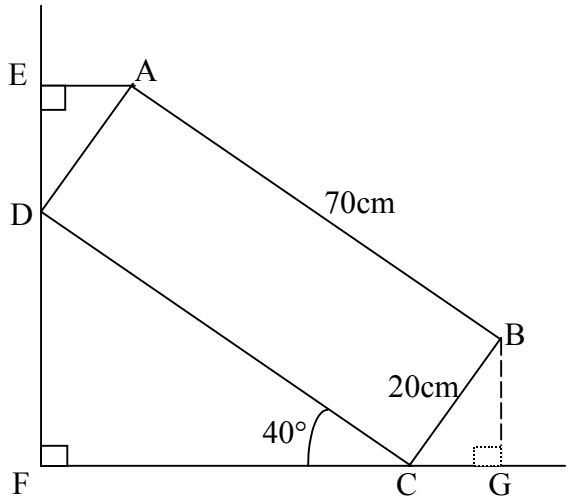


The rectangular sheet of paper in the figure just covers the curved surface of the cylinder.
Find, correct to three significant figures,
(a) the area of the rectangular sheet of paper

(b) the total surface area of the cylinder if it is closed at both ends.

_____(6marks)

11.



The figure represents a rectangular stone ABCD.
EDF represents the wall and FC the ground.
Calculate, correct to three significant figures,
(a) the vertical height of B above the ground
(shown as a dotted line BG)

(b) the vertical height of D above the ground

(c) the vertical height of A above the ground.

_____(8marks)

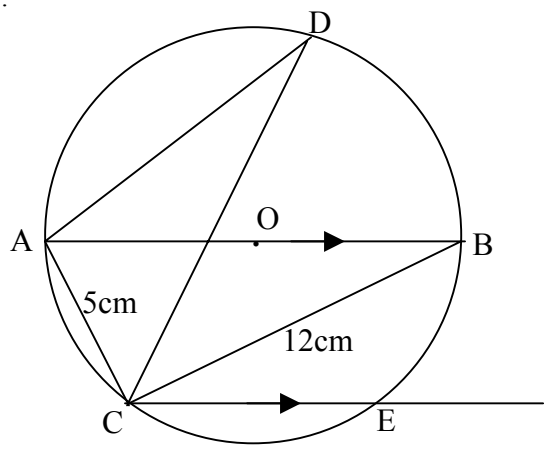
12. (a) Complete the table to find the values of y for the given values of x.

x	–3	–2	–1	0	1	2	3	4
$(x-3)$	–6	–5	–4	–3	–2	–1	0	1
$y = x(x-3)$	18		4	0		–2	0	4

(b) Draw the graph of $y = x(x-3)$. Take 2cm to represent 1 unit on the x axis and 1cm to represent 1 unit on the y axis.
From your graph
(i) solve the equation $x(x-3) = 0$
(ii) estimate the smallest value of y and the corresponding value of x.

(8marks)

13.



In the diagram AB is a diameter and O is the centre.
AC is 5cm and BC is 12cm long.
(a) Calculate:
(i) the length of AB

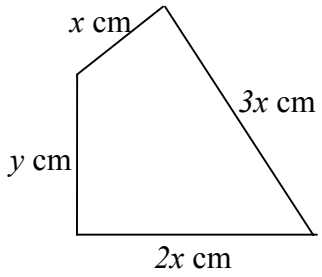
(ii) ∠ ABC to the nearest degree.

(b) Explain why ∠ADC = ∠BCE.

(8marks)

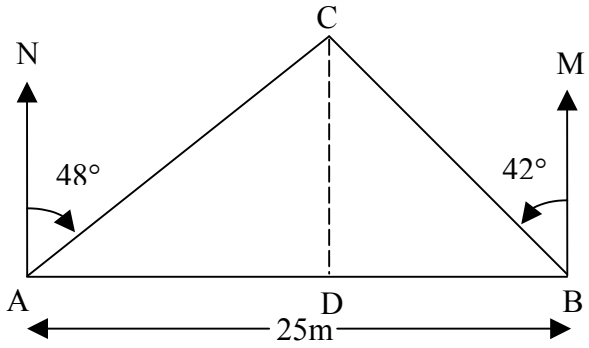
14. (a) Solve the simultaneous equations : $9x + 2y = 48$
$x - 2y = 2$

(b) The perimeter of the quadrilateral is 29cm and y is 1cm longer than x. Form two equations and solve them to find x and y.



(8marks)

15. In the diagram C represents the top of a vertical tower CD. NA and MB are lines perpendicular to ADB.



(a) From the diagram write down

i. the angle of elevation of C from A _____

ii. the angle of depression of B from C. _____

(b) Calculate angle C of triangle ABC. ∠C =_____

(c) Use a scale of 2cm to represent 5m to make a scale drawing of the above diagram. From your drawing

(i) measure the length of AC

(ii) work out the actual distance of C from A.

_____(8marks)