JUNIOR LYCEUMS ANNUAL EXAMINATIONS - 2003

Educational Assessment Unit - Education Division

FORM 3 MATHEMATICS (NON CALCULATOR PAPER) TIME: 10 minutes

Name _____

Class _____

Mark

ANSWER ALL QUESTIONS. THERE ARE 10 QUESTIONS TO ANSWER.

EACH QUESTION CARRIES 1 MARK.

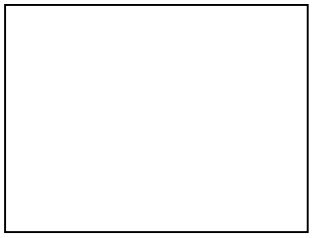
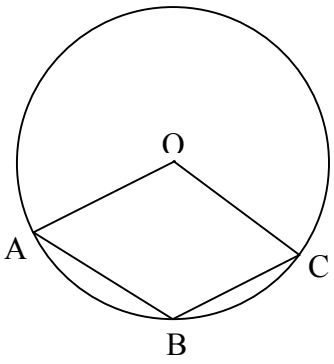
CALCULATORS, RULERS, PROTRACTORS AND OTHER MATHEMATICAL INSTRUMENTS ARE NOT ALLOWED.

ON YOUR DESK YOU SHOULD HAVE NOTHING EXCEPT FOR PEN, PENCIL AND THE EXAMINATION PAPER.

TO ANSWER QUESTIONS INVOLVING NUMERICAL CALCULATIONS YOU ARE ADVISED TO CHOOSE AND USE THE MORE EFFICIENT TECHNIQUES (MENTAL OR PENCIL-AND-PAPER).

YOU ARE NOT REQUIRED TO SHOW YOUR WORKING. HOWEVER SPACE FOR WORKING IS PROVIDED IF YOU NEED IT.

DO NOT WRITE IN THIS SPACE

QUESTION	SPACE FOR WORKING IF REQUIRED.
1. Work out 998×50 Ans_____	
2. Write the following numbers in order, smallest first. 3^0 , 3^1 , 3^{-1} , 3^2 , 3^{-2}. Ans _____, _____, _____, _____, _____.	
3. Write the value of $2x^2$ when $x = 3$. Ans_____	
4. The equation of a line is $y = 3x + 2$. Write down the gradient of the line. Ans_____	
5. Work out : $3.142 \times \frac{22}{7} \div \frac{11}{7}$ Ans_____	
6. Write an estimate for the area, in cm^2, of this rectangle.  Ans_____	
7. Decrease 50 by 10%. Ans_____	
8.  In the figure O is the centre of the circle. $\angle ABC = 120°$. What is the size of the reflex $\angle$ AOC? Ans_____	

9. Write the ratio $2\pi rh : 2\pi RH$ in its lowest terms when r = R, h = 5 cm and H = 10 cm. Ans_____	
10. Draw a sketch of the shape drawn by the turtle when given these logo commands. PD Repeat 5[FD 50 RT 72]	

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FORM 3 **MATHEMATICS (Main Paper)** **TIME: 1 h 50 min**

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total Main	Non Calculator Paper	**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. Work out a. $\left(\frac{1}{4}\right)^2$ as a fraction . Ans:_____

b. $\left(\frac{3}{4}\right)^{-2}$ as a mixed number.

Ans:_____

_____(4marks)

2. a. Factorise completely: $2x + 4x^2$

Ans:_____

b. Expand and simplify: $5(x - 1) - 3(x - 2)$

Ans:_____

_____(4 marks)

3. a. A trader bought an article for Lm300 and sold it to a retailer for Lm335.

Work out the percentage profit made by the trader correct to 2 significant figures.

Ans:_____

b. Work out the simple interest on Lm1050 at 5% per annum in 3 years.

Ans:_____

_____(4marks)

4. a. Make a the subject of the formula $v = u + \frac{at}{2}$.

Ans:_____

b. Work out the value of a when $v = 10$, $u = 8$ and $t = 12$.

Ans:_____

_____(4marks)

5. a. What is the number of sides of a regular polygon whose exterior angle is 36°?

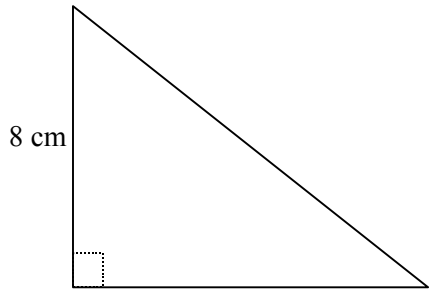
Ans:_____

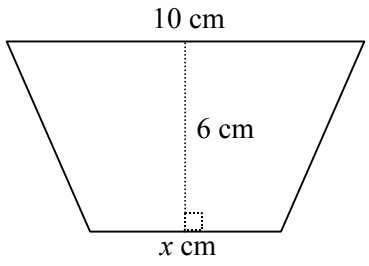
b. Is it possible for each interior angle of a regular polygon to be 130°?
(Give a reason for your answer)

Ans:_____

_____(4marks)

6.





In the figure the area of the triangle is equal to the area of the trapezium.

a. What is the area of the trapezium?

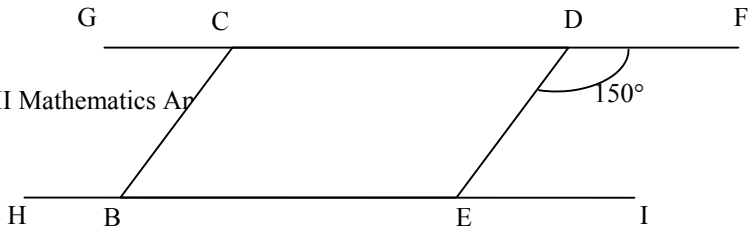
Ans:_____

b. Work out the value of ***x***.

Ans: x = _____

_____(6marks)

7. BCDE is a parallelogram. GF and HI are straight lines.

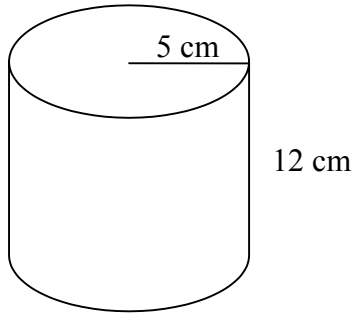


a. Calculate, giving reason for your answer, the size of $\angle BED$.

b. Show that $\angle GCB = \angle DEI$.

_____(6marks)

8.



a. Calculate the volume of the cylinder in the figure.
Give your answer correct to three significant figures.

Ans:_____

b. The curved surface area of another cylinder is 60π cm^2.
The height of the cylinder is 2.5 cm. Calculate the radius of the cylinder.

Ans:_____

_____(6marks)

9. Simplify : a. $\frac{xy}{6} \times \frac{3}{x^2}$

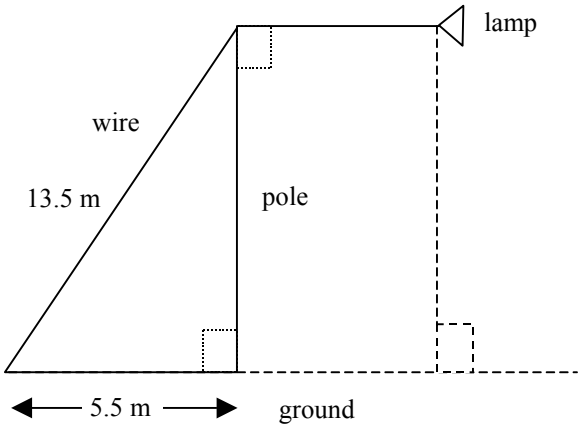
Ans:_____

b. $\frac{x+2}{3}+\frac{x-1}{2}$

Ans:_____

_____ (6marks)

10. A lamp is fixed above the ground as shown in the figure. Calculate the height of the lamp above the ground. Give your answer correct to the nearest cm.



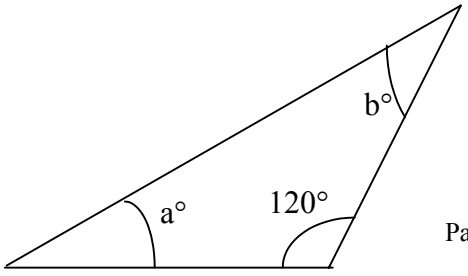
Ans:_____

_____(6marks)

11. a. Solve the simultaneous equations:

$$x + 2y = 9$$
$$2x - y = -2$$

b. In the triangle a is bigger than b. The difference between a and b is 36. Find a and b.



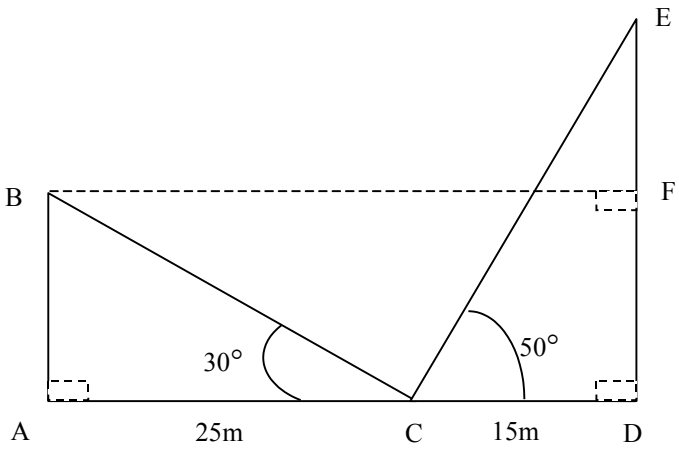
Ans:_____

_____(8marks)

12.

In the figure AC = 25m and CD =15m.
Work out, giving your answers correct
to the nearest metre

a. the length AB



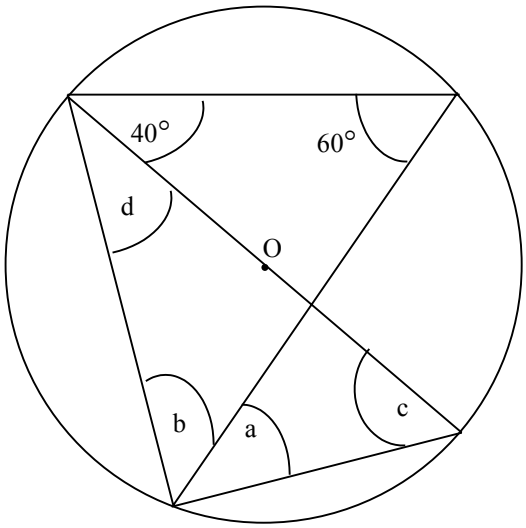
b. the length DE

c. the length EF

Ans:_____

_____(8marks)

13.



In the figure O is the centre of the circle. Calculate, giving reasons for your answers, the size of the angles marked a,b,c,d.

a = _____

b= _____

c= _____

d= _____

_____(8marks)

14. a. Complete the table for $y = x^2$ for values of x from –3 to 3.

x	–3	–2	–1	0	1	2	3
x^2	9		1	0	1		9
y							

b. Draw the graph of $y = x^2$. Take 2 cm to represent 1 unit on both axes.

c. Complete the table for $y = x + 3$ for values of $x = -3, 0, 3$

x	–3	0	3
+3			
y			

Draw the graph of $y = x + 3$ on the same graph and using the same scale and axes.

d. From your graph read the values of x^2 and that of $x + 3$ when $x = 2.5$.

Ans: x^2 = _____, $x + 3$ = _____.

e. Which is the greater x^2 or $x + 3$ when $x = -2.5$?

Ans:_____

_____(8marks)

15. The table shows the marks obtained by 200 girls in an English Language test.

Mark	0 - 9	10 -19	20 -29	30 - 39	40 - 49	50 - 59
Frequency	40	***x***	30	30	40	***y***

It is known that $x : y = 2 : 1$. Find x and y.

Ans:_____

a. Complete the table and draw a histogram on the graph paper provided.
Use 2 cm to represent 5 students and 2 cm to represent 10 marks.

b. In which group is the median mark?

Ans:_____

c. A student is picked at random. What is the probability that she passed the test if the pass mark was 30?

Ans:_____

_____(8marks)