

JUNIOR LYCEUM ANNUAL EXAMINATIONS 2004

Educational Assessment Unit - Education Division

FORM 3

MATHEMATICS (Non Calculator)

TIME: 10 minutes

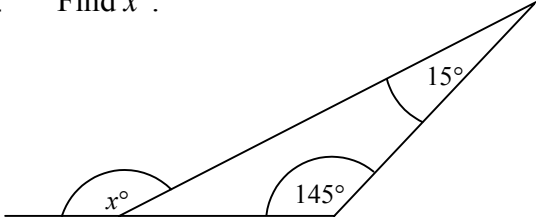
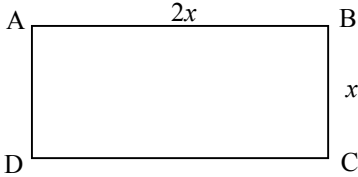
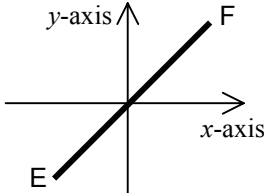
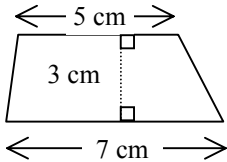
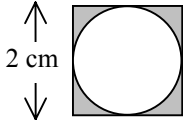
Name _____

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. Write in ascending order: $0.33, \frac{1}{3}, \frac{3}{10}$	
2. Evaluate: $15 \times 97 + 3 \times 15$	
3. Complete the following sequence: $1\frac{1}{2}, 2\frac{1}{4}, 3, \underline{\hspace{2cm}}$	
4. Find x° : 	
5. The perimeter of rectangle ABCD is 360 cm. Find x . 	
6. Which is the largest sum of money? (A) 20% of Lm200 (B) $\frac{1}{4}$ of Lm240 (C) 0.25 of Lm100	
7. A radio and three mobiles cost Lm280. A radio and two mobiles cost Lm200. Find the cost of the radio.	
8. Which is the correct equation of the line EF? (A) $y = 2x + 1$ (B) $y = -x + 2$ (C) $y = x$	
9. Find the area of the trapezium. 	
10. Taking $\pi \approx 3$, estimate the area of the shaded region. 	

JUNIOR LYCEUM ANNUAL EXAMINATIONS 2004

Educational Assessment Unit - Education Division

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	NC	Main	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. (a) Expand the following:

(i) $3(2 - 5x)$

(ii) $2x(3 + 2x)$

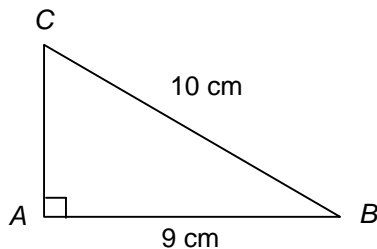
(b) Factorise the following:

(i) $2p - 3p^2$

(ii) $3x^3 - 6x^2 + x$

(4 marks)

2.



Find side AC correct to 2 decimal places.

(4 marks)

3. In a factory there are 25 employees. In a particular week 24 of these employees worked altogether 1104 hours. The average for all 25 workers was 45.5 hours. Find the number of hours worked by the remaining employee.

(4 marks)

4.

	A	B
1		
2	Length:	2
3	Width:	3
4	Height:	
5		
6	Volume:	30
7		

The diagram on the left shows part of a spreadsheet. The spreadsheet is used to calculate the volume of a cuboid for different values of length, breadth and height.

(i) For the given value of the volume state the value of cell B4:

(ii) Write down the formula in cell B6:

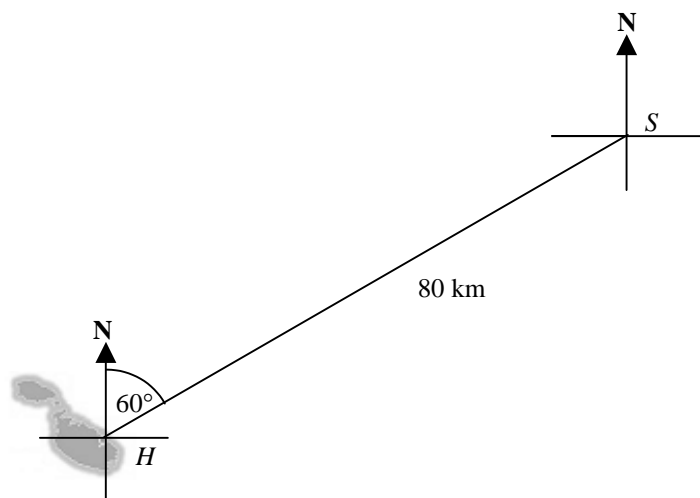
(4 marks)

5. A ship *S* lies 80 km on a bearing of 060° **from** the Grand Harbour *H*. A patrol boat *P* lies 50 km due West **of** the ship.

(i) Complete the scale diagram below to represent the above information.
(Use a scale of 1 cm for 10 km.)

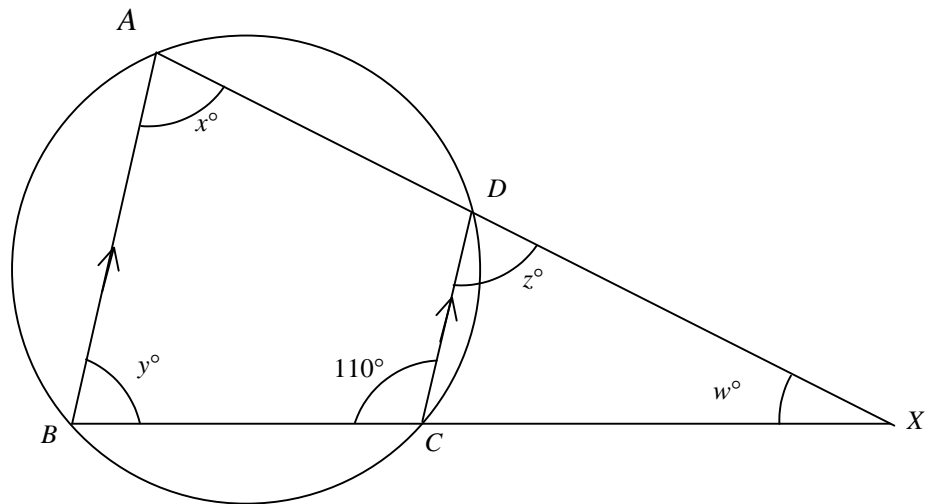
(ii) Use your diagram to find the distance in kilometres, to the nearest kilometre, of the patrol boat from the harbour.

(iii) By measuring a suitable angle write down the bearing of the harbour **from** the patrol boat



(4 marks)

6.



$ABCD$ is a cyclic quadrilateral with side AB parallel to side CD . AD and BC are produced and meet at point X . $\angle BCD = 110^\circ$. Find, giving reasons for your answers, the following:

(i) $x^\circ =$

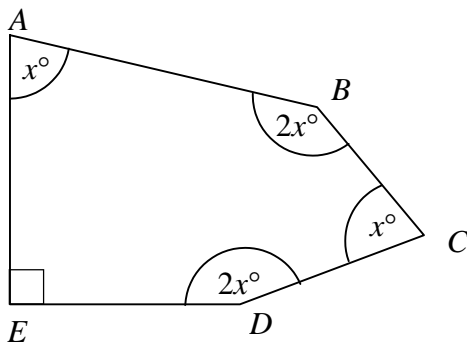
(ii) $y^\circ =$

(iii) $z^\circ =$

(iv) $w^\circ =$

(8 marks)

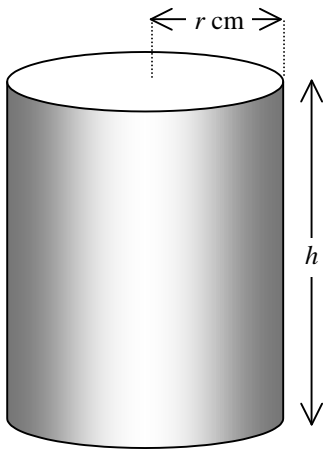
7.



$ABCDE$ is a pentagon. Work out the value of x° from the diagram.

(6 marks)

8.



A cylinder has **radius** r cm. It's height h is four times it's diameter D .

- (i) Complete: $h = \underline{\hspace{2cm}}$
- (ii) Write down the equation of h in terms of r .
- (iii) The volume of a cylinder is given by $V = \pi r^2 h$. Use the result of part (ii) to express this formula in terms of r .
- (iv) Find the volume in cm^3 of the cylinder correct to 1 d.p. given that $r = 7$ cm.

(8 marks)

9. (i) Find the value of p given that $v = 2p + qr$ when $v = 3$, $q = 0.25$ and $r = 40$.

(ii) Solve the equation $3(2x - 1) = 9$.

(6 marks)

10. Complete the following table given that $y = 2x^2 - 2x + 3$.

x	-3	-2	-1	0	1	2	3	4
y	27	15		3	3	7		27

- (i) Plot on the graph paper provided and using the table you have completed the graph of $y = 2x^2 - 2x + 3$. (Use 2 cm to represent 1 unit on the x -axis, and 1 cm to represent 1 unit on the y -axis.)
- (ii) From the graph determine the minimum value of y and the value of x where this occurs.

Minimum value of y : _____ Value of x : _____

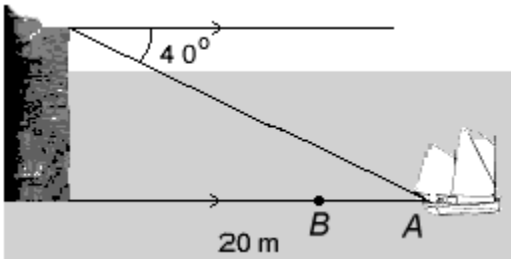
- (iii) Use your graph to solve the equation $2x^2 - 2x + 3 = 6$.

$x =$ _____, $x =$ _____.

(10 marks)

11.

A sailing boat is at A which is 20 m away from the foot of a cliff. The angle of depression of the boat from the top of the cliff is 40° .



- (i) Find to the nearest metre the height of the cliff.

- (ii) The boat approaches the cliff by 5 m to point B. Find, to the nearest degree, the new angle of depression.

(6 marks)

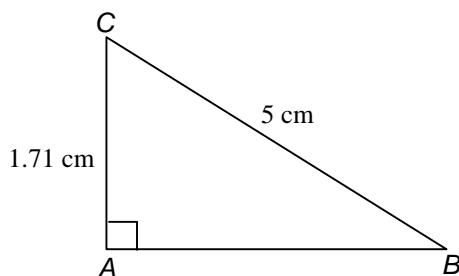
12. The table below gives the number of CD players sold in a shop per month for the first six months in the year 2000.

Month	Jan	Feb	Mar	Apr	May	Jun
Number of CD players	15	25	25	22	18	15

- (a) Find the mean number of CD players sold per month.
- (b) Find the median number of CD players sold.
- (c) John bought a CD player between January and June. What is the probability that he bought it in June?

(6 marks)

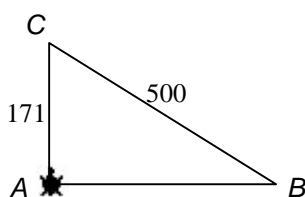
13.



A triangle ABC is right-angled at A , BC is 5 cm long and AC is 1.71 cm long.

- (a) Find $\angle ACB$ to the nearest degree.
- (b) Find side AB .

- (c) Using the information you found in (a) and (b) write a LOGO program which draws triangle ABC with $BC = 500$ units and $AC = 171$ units.



PD

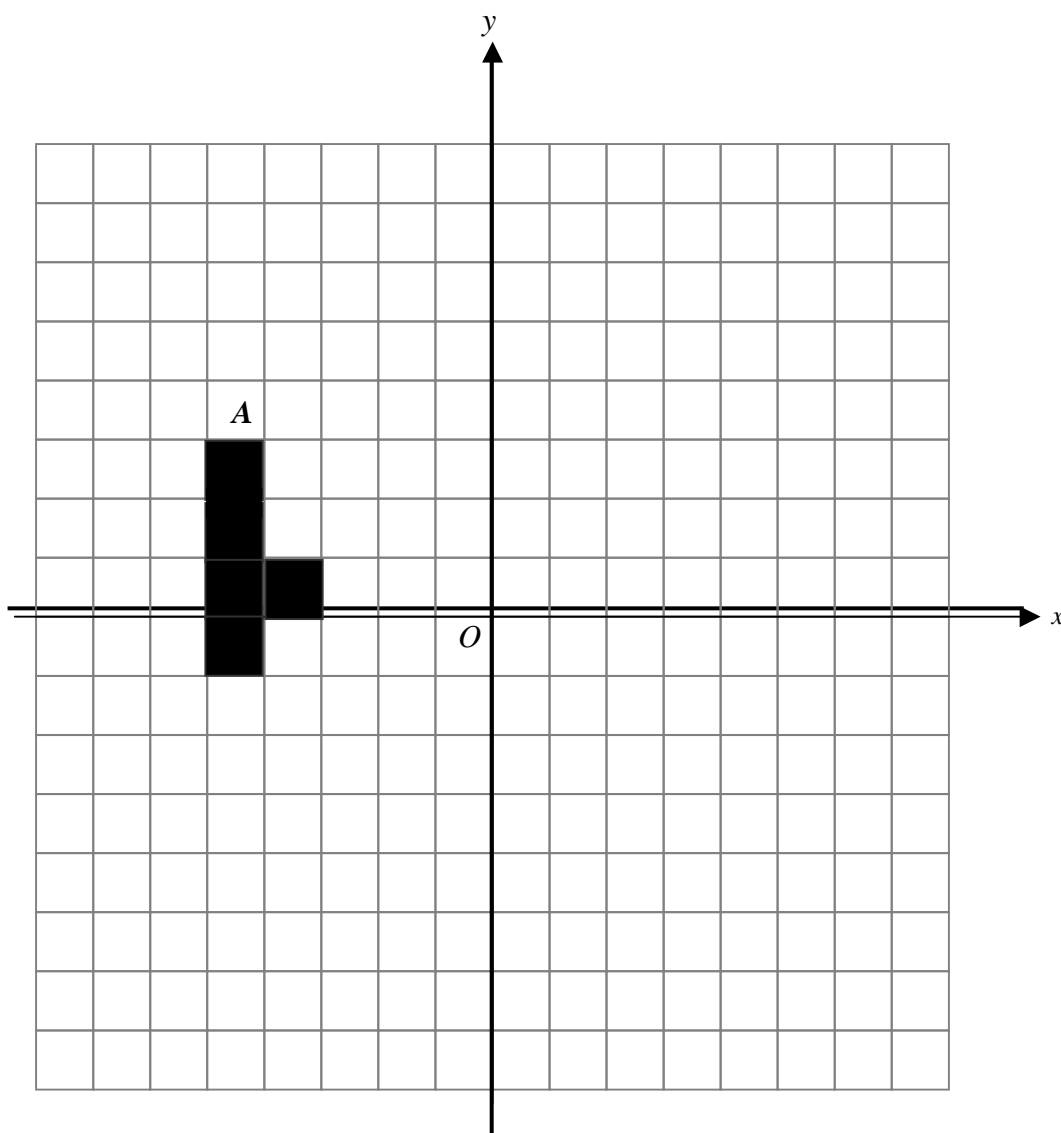
(8 marks)

14. *Mark and label your diagrams clearly.*

(a) Rotate shape *A* clockwise by 90° about the origin *O*. Label the shape *B*.

(b) Reflect *B* in the *x*-axis. Label the shape *C*.

(c) Translate *C* by the column vector $\begin{pmatrix} 3 \\ 5 \end{pmatrix}$. Label the shape *D*.



6 marks

15. A man wants to invest Lm 20,000 in one of two banks for five years. *Finance International* offers 5% simple interest per year. *Credit Investments* offers 6% simple interest per year for the first two years and 4% simple interest per year for the remaining years. Which bank offers the better interest and by how much?

(6 marks)

End of paper