JUNIOR LYCEUM ANNUAL EXAMINATIONS 2005

Educational Assessment Unit - Education Division

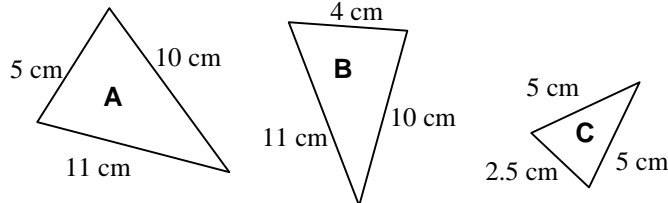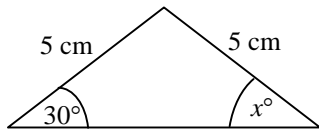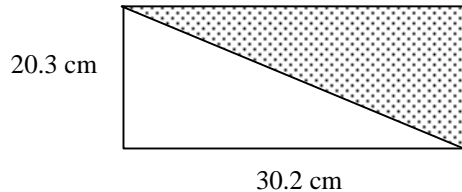|		
FORM 3	**MATHEMATICS (Non-Calculator)**	**TIME: 10 minutes**
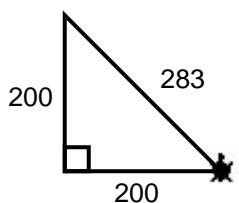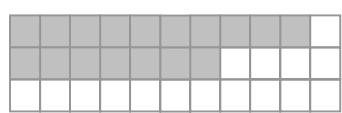
Name _____

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.	Work out $260 \times 25 - 60 \times 25$.	
2.	Complete the LOGO program which draws the figure on the left. **PD** **LT** _____ **FD 283** **LT 135** **FD 200** **LT 90** **FD 200**	
3.	Three bottles of lemonade and two hamburgers cost Lm2.50. One bottle of lemonade and two hamburgers cost Lm1.90. How much does a bottle of lemonade cost?	
4.	There are 250 students in a school. 100 study Italian and 70 study French. The rest study German. Assuming that each student studies only one language, complete the chart. Italian French German	
5.	A car leaves Attard at 11:45 pm and arrives at Mellieha 3 hours and 35 minutes later. At what time did it arrive?	
6.	Which triangle has the largest area?	
7.	Which is the largest quantity? (A) 20% of Lm 1200 (B) ¼ of Lm 1300 (C) 0.35 × Lm 200	
8.	What is the value of $x°$?	
9.	Find x given that $3x + 5 = 11$.	
10.	Estimate the area of the shaded triangle.	

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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	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.

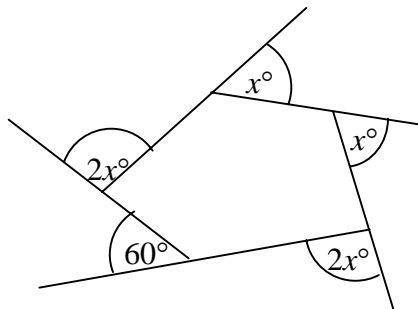1. (a) Solve the equation $3x + 2 = 4 - 5x$.

   (b) Solve the simultaneous equations
   $$3p - 2q = 5$$
   $$p + 2q = 3$$

   (4 marks)

2.

   (a) The sum of the exterior angles of a polygon is equal to ____.

   (b) Find the value of the angle $x°$.

   (4 marks)

3. Simplify the following:

   (a) $a^5 a^{-3} a^4 =$ _____

   (b) $\dfrac{x^4 x^{-2}}{x^{-1}} =$ _____

   (4 marks)

4. (a) Janica bought a dress marked "Lm35 + 18% VAT". How much did she pay for the dress?

    (b) Albert bought a jacket for Lm 26, including 18% VAT. Find the price without VAT.

    (4 marks)

5.

	A	B	C	D
1	2	4	6	2
2	1	3	3	
3				
4				

Cell D1 has a formula which depends on the values in cells A1, B1 and C1.

(a) Which of the following formulae is the correct one?

    (i) = 2*A1 − B1 + C1   (ii) = 3*B1 − A1 + C1   (iii) = A1*B1 − C1

    Answer: _____

    (b) The formula in cell D2 has the same form as in D1 **but** depends on the values in cells A2, B2 and C2. Find the value in cell D2.

    (4 marks)

6. There are 17 red, 14 blue and 4 white beads in a box.
    Give your answers to the questions below in the form of an ordinary fraction.

    (a) What is the probability of picking randomly a white bead?

    Answer: _____

    (b) What is the probability of **not** picking a white bead?

    Answer: _____

    (c) What is the probability of picking either a red or a white bead?
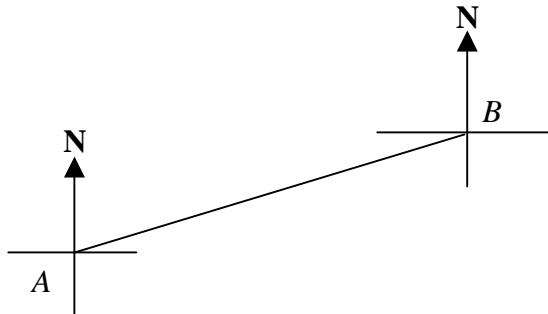
    Answer: _____

    (6 marks)

7.   Albert (*A*), Bernard (*B*) and Charles (*C*) are in a horizontal field.
     Use the diagram below to answer the following questions.
     (*Use a scale of* 1 cm *for* 50 m.)

     (a)   Find the bearing of Bernard **from** Albert.

                                                                    Answer: _____

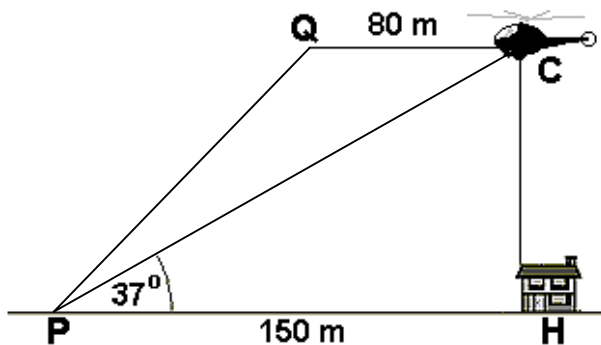   (b)   Charles has a bearing of 127° **from** Bernard and is 360 m away from him. Complete the
           diagram.

     (c)   Find the bearing of Charles **from** Albert.

N

                                                          B   Answer: _____

N

A

                                                                              (6 marks)

8.   **Q**   80 m   A point P is 150 m away from a house H.
   **C**   When a helicopter C is directly above the
                                                      house, its angle of elevation is 37° from P.

                                                      (a)   Find, to the nearest metre, the height
                                                            above the ground of the helicopter.

        37⁰
      P   150 m   **H**

     (b)   The helicopter flies to point Q, 80m
           away from its original position,
           keeping the same height above
           ground. Find, to the nearest degree,
           the new angle of elevation of the
           helicopter from point P.

                                                                              (6 marks)

9.
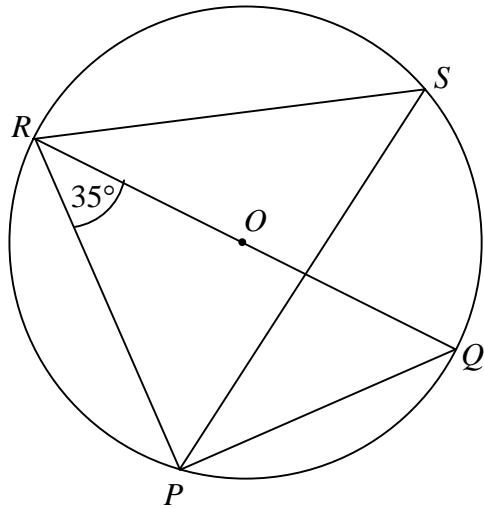
In the diagram O is the centre of the circle.

Give reasons for your answers to the following questions:

(a)   Find $\angle QPR$.

(b)   Find $\angle PQR$.

(c)   Find $\angle PSR$.

(6 marks)

10.   (a)   Three men, Alfred, Billy and Charles together bought a lottery ticket costing Lm11. Alfred paid Lm2, Billy Lm5 and Charles paid the rest. They won a prize of Lm1230 and are to divide it among themselves in the ratio of the amount each paid.

Find, to the nearest cent, the amount each won.

Alfred: _____   Billy: _____   Charles: _____

(b)   A man invests a sum of Lm3300 in a bank at 4% simple interest. Find the interest earned after three years.

(6 marks)

11. (a) Complete the table below for the curve $y = 4 - 3x - x^2$.

x	-4	-3	-2	-1	0	1	2
y	0		6		4		-6

(b) Plot the graph of $y = 4 - 3x - x^2$ on the graph paper provided using the table you have completed above. *Take values of x from −4 to 2. Use a scale of 2cm to represent 1 unit on both axes.*

(c) Use your graph to find the maximum value of *y* and the value of *x* where this occurs.

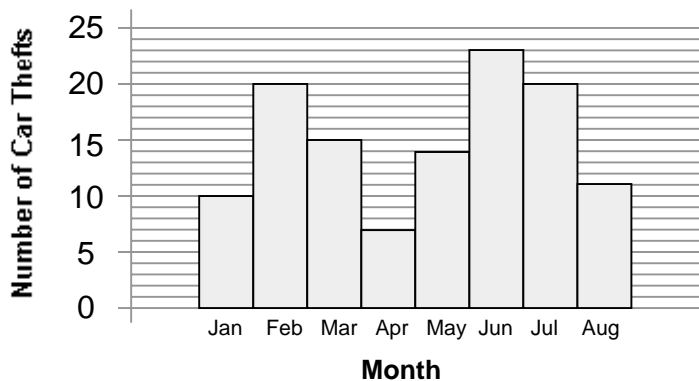   Maximum value of *y*: _____   Value of *x*: _____

(d) Use your graph to solve the equation $4 - 3x - x^2 = 3$.
   (*Give your answer correct to* 1 d.p.*)*

   x = _____ ,   *x* = _____

                                                                                    (8 marks)

12. The bar chart below shows the number of car thefts in a certain town for the first eight months of 2003. For the period January to August:

(a) Find the total number of thefts.

(b) Find the mean number of thefts per month.

(c) Find the range of thefts.

(d) Find the median number of thefts.

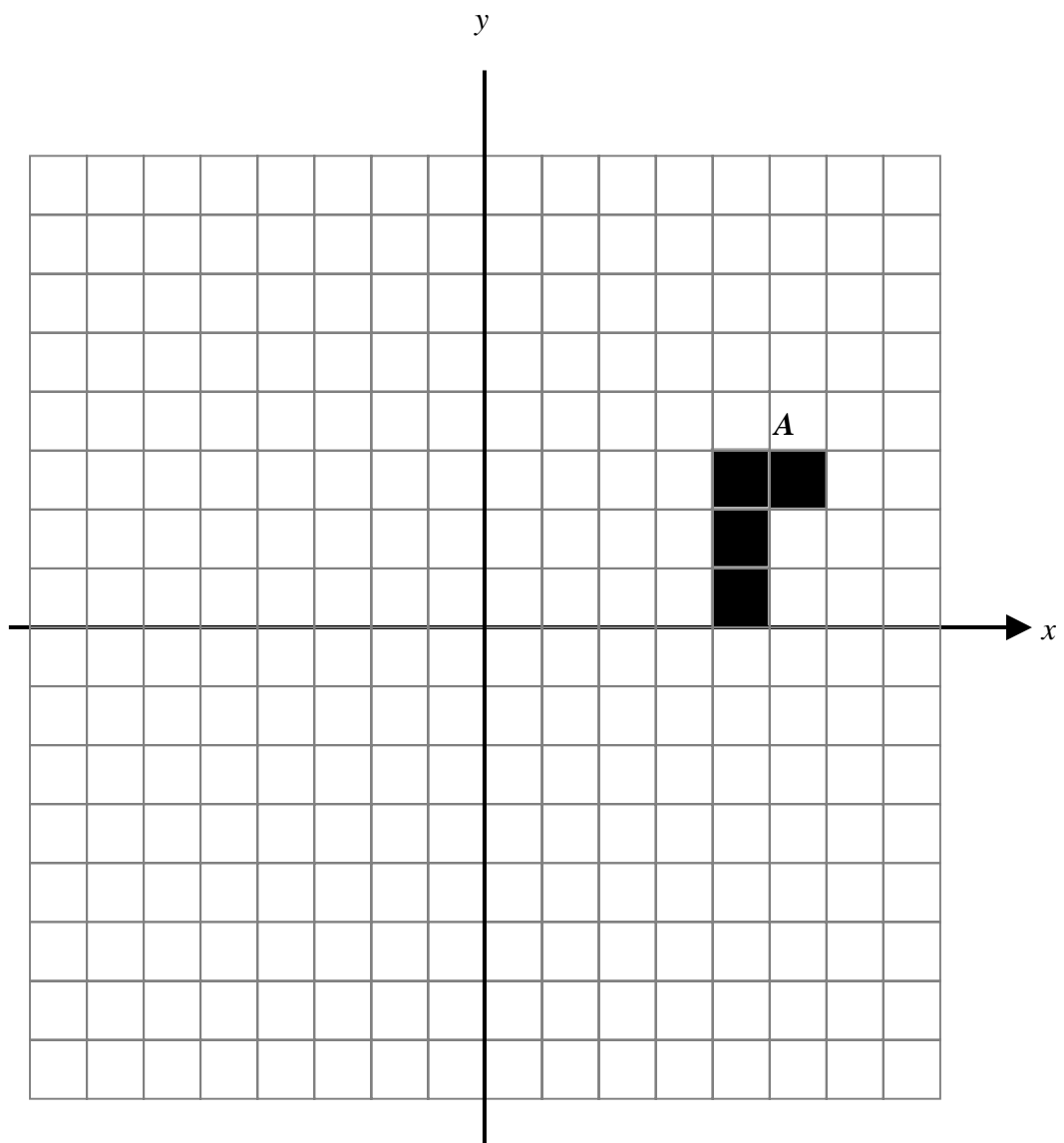   **(8 marks)**

13.   *Mark and label your diagrams clearly.*

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

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

(c)   Translate *C* by the column vector
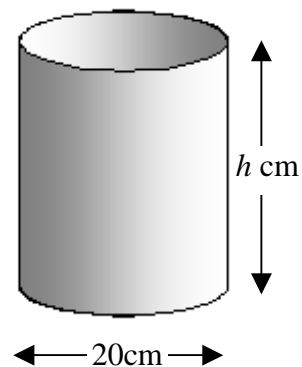 $\begin{pmatrix} -3 \\ -8 \end{pmatrix}$. Label the new shape *D*.
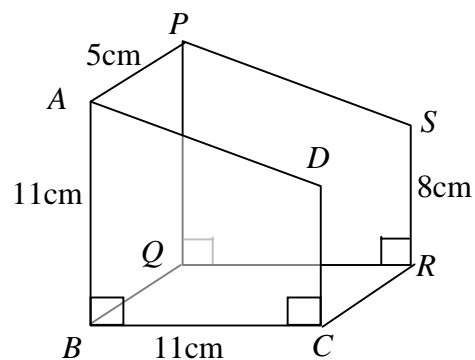

(8 marks)

14. (a) A hollow tube in the form of a cylinder has a diameter of 20cm.

Find the height h to the nearest centimetre if its **curved** surface area is $900\pi\,\text{cm}^2$. *(The curved surface area of a cylinder is $2\pi rh$)*

h cm

20cm

(b) A magazine holder consists of a rectangular base *BCRQ*, a rectangular back *ABQP*, and two equal and parallel trapeziums *ABCD* and *PQRS*.

Find the total surface area of the magazine holder.

5cm

P

A

S

D

11cm

8cm

Q

R

B 11cm C

(8 marks)

15. (a) Draw the shape formed by the turtle executing
the following LOGO program:

```
PD
REPEAT 2[FD 100 RT 120 FD 100 RT 60]
```

(b) What is the perimeter, in turtle steps, of the shape in part (a)?

(c) Write the LOGO commands for the turtle to draw a square of **perimeter** 400 turtle steps.

(8 marks)

End of paper