

# SECONDARY SCHOOL ANNUAL EXAMINATIONS 2005

Educational Assessment Unit – Education Division

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**FORM 5****MATHEMATICS (Non Calculator Paper)****TIME: 20 min**

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Name: \_\_\_\_\_


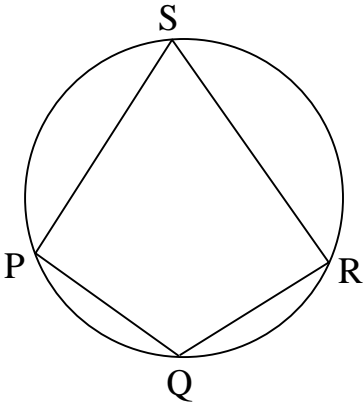
Class: \_\_\_\_\_


Mark

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## INSTRUCTIONS TO CANDIDATES

- **ANSWER ALL QUESTIONS. THERE ARE 20 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 A PEN, PENCIL AND 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.**
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No.	QUESTION	SPACE FOR WORKING (IF REQUIRED)
1.	Find the value of $\frac{1}{5}$ of $\frac{1}{5}$ of 25.      Ans: _____	
2.	 <p>The <b>perimeter</b> of a <b>semi-circle</b> of radius 10 cm is approximately:</p> <p>A) 30 cm    B) 50 cm    C) 60 cm    D) 80 cm.</p> <p>Ans: _____</p>	
3.	What is the value of $10 \div 3\frac{1}{3}$ ?      Ans: _____	
4.	What is the <b>square root</b> of <b>one million</b> ?    Ans: _____	
5.	I walked a distance of 2 km in 40 minutes. What was my average speed in km/h?    Ans: _____	
6.	Find the value of $4x^2$ when $x = 5$ .      Ans: _____	
7.	 <p>PQRS is a cyclic quadrilateral. When <math>\angle PSR</math> is <b>increased</b> by <math>15^\circ</math>, then <math>\angle PQR</math> is:</p> <p>A) <b>increased</b> by <math>15^\circ</math></p> <p>B) <b>decreased</b> by <math>15^\circ</math></p> <p>C) <b>increased</b> by <math>30^\circ</math></p> <p>D) <b>decreased</b> by <math>30^\circ</math></p> <p>Ans: _____</p>	

No.	QUESTION	SPACE FOR WORKING (IF REQUIRED)
8.	<p>The turtle starts at the position shown. Make a sketch of what the turtle draws to satisfy these LOGO commands.</p> <p>PD FD 70 RT 90 FD 140 LT 90 FD 70</p>	
9.	<p>Karen was using a spreadsheet. In cell <b>A1</b> she typed 12. In cell <b>A2</b> she typed 6. In cell <b>A3</b> she typed the formula = <b>A1 – A2/3</b>. What value did Karen obtain in cell <b>A3</b>?</p> <p>Ans: _____</p>	
10.	<p>A bag contains 4 green, 5 yellow and 3 brown balls. Mario picked a ball at random from this bag. What is the probability that it is <b>not green</b>? Give your answer as a <b>fraction</b> in its <b>lowest terms</b>.</p> <p>Ans: _____</p>	
11.	<p>The value of <b><i>n</i></b> when <math>2^n = 8</math> is: A) 8      B) 4      C) 3      D) 2.</p> <p>Ans: _____</p>	
12.	<p>John shared a number of sweets. He gave <math>\frac{1}{4}</math> of them to his sister Sue and <math>\frac{1}{3}</math> of the <b>remainder</b> to his brother Daniel. What <b>fraction</b> of the original number of sweets did Daniel receive?</p> <p>Ans: _____</p>	
13.	<p>4 pens and 3 rubbers together cost 76 cents. 3 pens and 2 rubbers together cost 53 cents. What is the <b>total</b> cost of <b>2</b> pens and <b>2</b> rubbers?</p> <p>Ans: _____</p>	



**SECONDARY SCHOOL ANNUAL EXAMINATIONS – 2005**

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**FORM 5****MATHEMATICS (Main Paper)****TIME: 1h 40min.**

1	2	3	4	5	6	7	8	9	10	11	12	13	Total Main	Non Calculator	GLOBAL MARK

**DO NOT WRITE ABOVE THIS LINE****Name:** \_\_\_\_\_**Class:** \_\_\_\_\_**INSTRUCTIONS:**

**CALCULATORS ARE ALLOWED BUT ALL NECESSARY WORKING MUST BE SHOWN.  
ANSWER ALL QUESTIONS.**

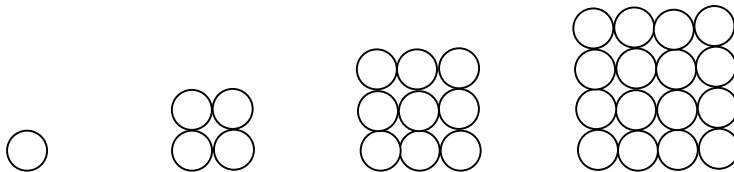
1. **Lm1 is equivalent to €2.38.** Use this rate of exchange for both parts of this question.

a) Change Lm 500 to euro.

b) What is the value of 1 euro in Maltese currency? Give your answer correct to the nearest cent.

(4 marks)

2. Shapes containing equal circles follow the pattern as shown.



Write down the number of circles in:

a) the next shape \_\_\_\_\_

b) the 10<sup>th</sup> shape \_\_\_\_\_

c) the  $n^{\text{th}}$  shape \_\_\_\_\_

(5 marks)

3. a) Simplify: (i)  $y^5 \times y^3 \div y^2$  (ii)  $4^2 + 3^0 - 2^{-1}$ .

b) Find the value of  $n$  when  $a^n = \frac{1}{a^4}$

(5 marks)

4. a) Factorise completely  $24 - 4x$ .

b) Use the formula  $P = 3n - m^2$ .

(i) Find the value of  $P$  when  $n = 5$  and  $m = -2$ .

(ii) Make  $n$  the subject.

(5 marks)

5. The figure shows part of a spreadsheet that Claire used to work out a problem on a **triangle**.

	A	B	C	D
1	base in cm	height in cm	area in cm <sup>2</sup>	
2	24	19		
3				

a) **Underline** the correct formula that Claire used in cell **C2** to obtain the area of the triangle.

$=A2 + B2/2$

$=(A2 + B2)/2$

$=A2*B2/2$ .

b) What value did Claire obtain in cell **C2** ?

c) In cell **A2**, Claire entered 37 for the base of **another** triangle. What value in cell **B2** did Claire enter to obtain an area of 259 in cell **C2** ?

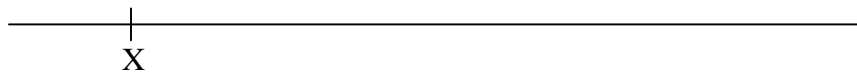
(5 marks)

Name: \_\_\_\_\_

Class: \_\_\_\_\_

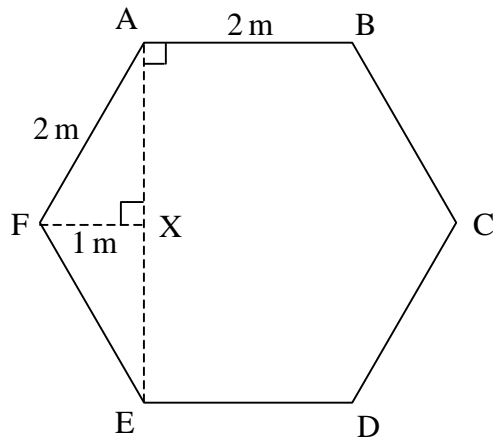
6. Use ruler and compasses only. All construction lines and arcs must be clearly shown.

- a) Mark a point Y on the given line so that XY is 7.5 cm long.
- b) Construct the **perpendicular bisector** of the line XY.
- c) Mark a point Z on this perpendicular bisector such that XZ is of length 5 cm and Z is **above** XY.
- d) Finally construct a circle with centre Z that passes through X and Y.



(5 marks)

7.



A swimming pool is in the shape of a **regular hexagon** of side 2 metres. The length of FX is 1 metre. The base of the pool is covered with blue tiles.

a) Work out the size of  $\angle BAF$ .

b) Calculate, giving your answers correct to 3 decimal places:

- (i) the length of AX in metres
- (ii) the area of **trapezium** ABCF, in  $\text{m}^2$
- (iii) the area of blue tiles needed to cover the floor of the pool ABCDEF, in  $\text{m}^2$ .

(i)

(ii)

(iii)

(8 marks)

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

b) **One** CD player and a set of 6 CDs together cost Lm 57.

The **same** CD player and a set of 4 CDs together cost Lm 49.

(i) Let Lm  $x$  be the cost of the **CD player** and let Lm  $y$  be the cost of 1 CD.

Write down two equations connecting  $x$  and  $y$ .

(ii) Use these equations to find the value of the **CD player**.

(8 marks)



9. This question refers to a pack of cards numbered 2, 3, 5, 7, 11 and 13.  
 The cards were placed face down on a table in a random order.  
 Mario picked a card at random . He replaced it face down and picked a second card at random from the same pack.  
 a) Complete the possibility space diagram for the **SUM** of both cards picked.

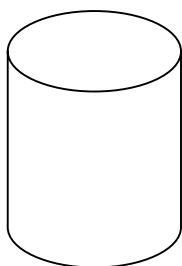
		2nd card picked					
		2	3	5	7	11	13
1st card picked	2		5	7	9	13	15
	3	5		8	10	14	16
	5	7	8		12	16	18
	7	9	10	12		18	20
	11	13	14	16	18		24
	13	15	16	18	20	24	

- b) Use the completed possibility space diagram to find the probability that the **sum** of both cards picked:

- (i) is **less than 10**. \_\_\_\_\_
- (ii) is **an even number** \_\_\_\_\_
- (iii) is **a square number**. \_\_\_\_\_

(8 marks)

10.



A solid metal cylinder has a **diameter** of 6 cm and a height of 8 cm.  
 1 cm<sup>3</sup> of the metal weighs 6.5 grams.

a) Calculate:

- (i) the **radius** of the cylinder  
 (ii) the **volume** of the cylinder correct to the nearest cm<sup>3</sup>  
 (iii) the **weight** of the cylinder correct to the nearest gram.

(i)

(ii)

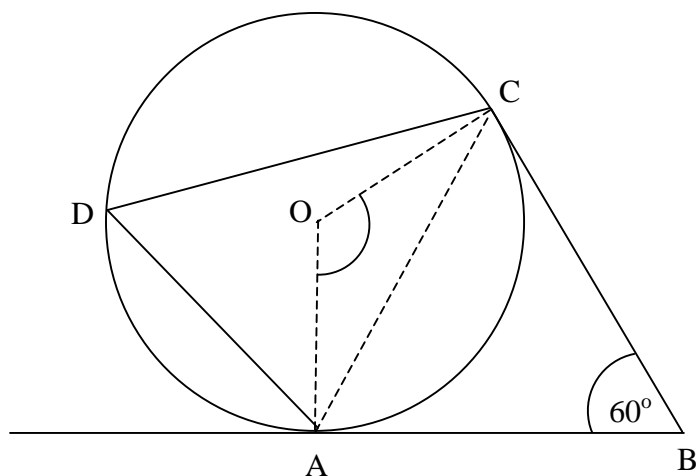
(iii)

- b) The metal cylinder **fits exactly** inside a rectangular box. What are the dimensions of the box?

length = \_\_\_\_\_ breadth = \_\_\_\_\_ height = \_\_\_\_\_

(8 marks)

11. AB and BC are two tangents drawn to a circle centre O as shown in the figure. Angle ABC is  $60^\circ$ .



- a) Work out the size of:
- (i) the marked angle AOC
  - (ii) angle ACO.
- b) If the radius of the circle is 10 cm, work out the length of the **minor arc** AC. Give your answer correct to 1 decimal place.
- c) What is the **ratio** of the length of the **minor arc** AC to the **circumference** of the circle? Give your answer in the form of  $1 : n$ .
- d) What is the size of angle ADC?

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(6 marks)

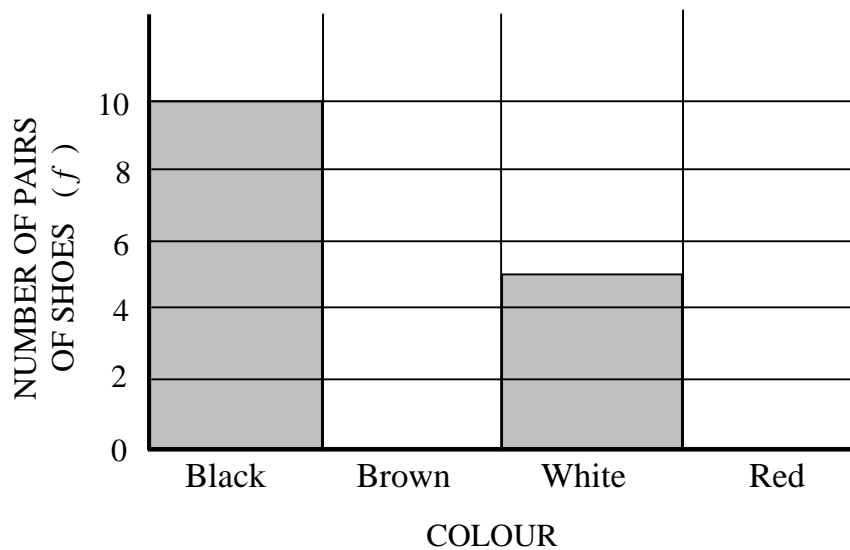
12. The table shows the number of pairs of shoes, by colour, that were sold at a certain shop last Saturday morning. It also shows the price for each pair of shoes.

a) Fill in the missing spaces in the table.

	Price for <b>each</b> pair of shoes ( $p$ )	Number of pairs of shoes sold ( $f$ )	$f \times p$
Black	Lm 12.50	10	Lm 125.00
Brown	Lm 15.00		
White	Lm 8.00	5	
Red	Lm 9.50	2	Lm 19.00
TOTAL		20	

b) Calculate the **mean** price for a pair of shoes.

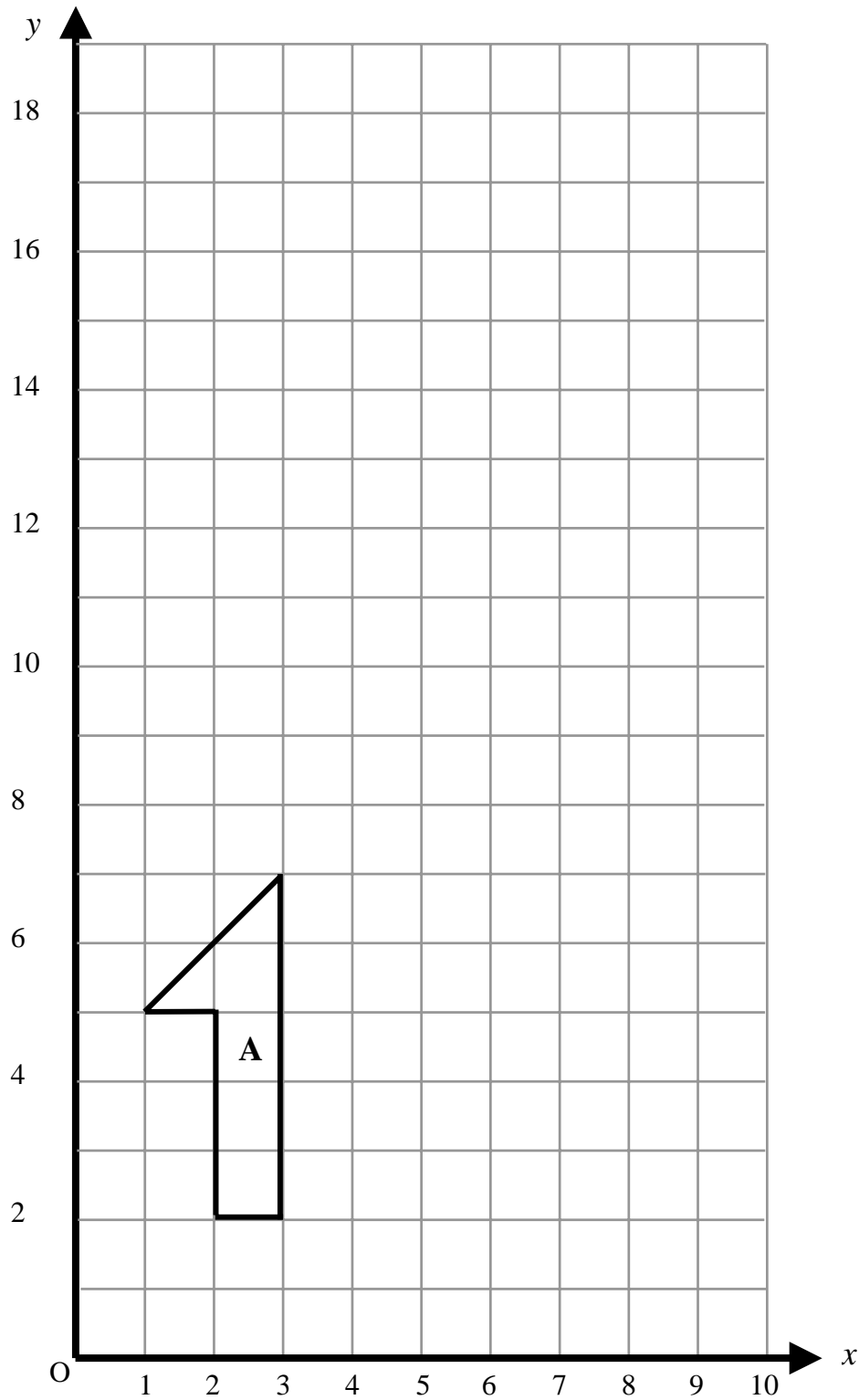
c) Use your table to complete the given bar chart.



(8 marks)

13. Use the given grid to:

- a) **Enlarge** figure A by a scale factor of 3 about the point (0,0) to obtain figure B.
- b) **Translate** figure A by the vector  $\begin{pmatrix} -1 \\ 5 \end{pmatrix}$  to obtain figure C.
- c) **Reflect** figure A in the line  $x = 3$  to obtain figure D.



(5 marks)

End of Paper