JUNIOR LYCEUM & SECONDARY SCHOOL ANNUAL EXAMINATIONS 2007

Educational Assessment Unit – Education Division

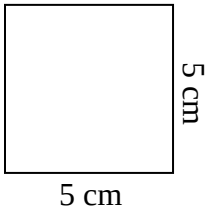
FORM 5 **MATHEMATICS (Non Calculator Paper – Option B)** **TIME: 20 minutes**

Name: _____ **Class: _____**

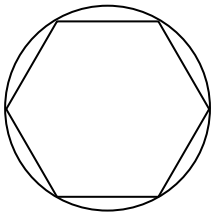
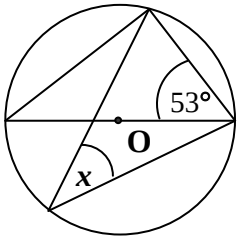
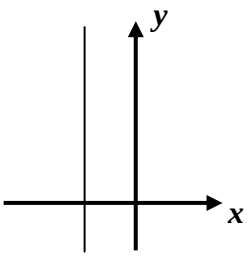
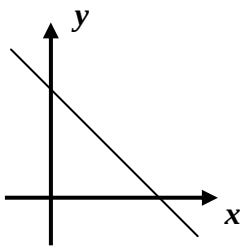
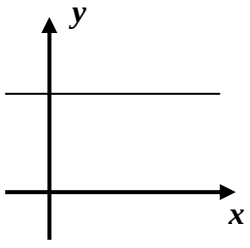
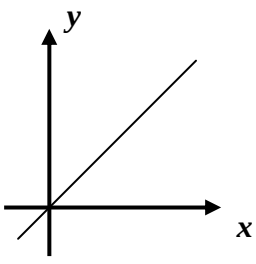
Mark

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.**
- **You are not required to show your working. However space for working is provided if you need it.**

No.	Question	Space for Working
1	Write down the value of $1-\left(\frac{1}{4}\times 3\right)$. **Answer:** _____	
2	What is 30% of Lm2? **Answer: _____** cents	
3	Write $\mathbf{3^{-2}}$ as a **fraction**. **Answer**: _____	
4	Write down the **Least Common Multiple** of **9** and **12**. **Answer:** _____	
5	$\mathbf{24 = 2^p \times 3^q}$. What is the value of $(p + q)$? **Answer: _____**	
6	$\mathbf{25^2 = 625}$. Write down the value of $\sqrt{\mathbf{6.25}}$. **Answer: _____**	
7	The **best estimate** for the **diagonal** of the square is: **A**. 5 cm **C**. 7 cm **B**. 6 cm **D**. 8 cm  **Answer: _____**cm	
8	The reciprocal of 2 is $\frac{1}{2}$ and the reciprocal of 4 is $\frac{1}{4}$. Write the **reciprocal** of 10 as a **decimal**. **Answer**: _____	

No.	Question	Space for Working
9	Work out the **gradient** of a line passing through the points A(−3, 4) and B(2, −6). **Answer: _____**	
10	Taking $\pi \approx 3$, find an approximation for the **area of a circle** having a radius of 2 cm. **Answer: _____**cm^2	
11	A number *P* is **increased** by 10%. The result is Q. Q is then **decreased** by 10%. The result is *R*. Which statement is correct? **A**. $P = R$ **B**. $P > R$ **C**. $P < R$ **Answer: _____**	
12	$x = 1.5 \times 10^2$. Write the value of $2x$ in **standard form**. **Answer: _____**	
13	Given that **1 gallon ≈ 4.55 litres**, change 10 gallons to litres. **Answer: _____**litres	
14	Mary bought 12 files at Lm1.50 each and 12 pens at 50 cents each. How much did she spend **altogether**? **Answer:** Lm_____	
15	Work out the size of each **exterior** angle of a **regular hexagon**. **Answer: _____**	
16	Write an equation in x (other than $x = 3$) whose solution is 3. **Answer**: _____	

No.	Question	Space for Working
17	The **diameter** of the circle is 10 cm. What is the **perimeter** of the **regular hexagon**?  **Answer:** _____cm	
18	O is the centre of the circle. Find the value of x.  **Answer:** _____	
19	A bag contains 5 blue discs and a number of red discs. The probability of choosing a blue disc is $\frac{1}{4}$. What is the **total** number of discs in the bag? **Answer:** _____	
20	Which **one** of the following shows the graph of $y = 5 - x$? **A**.  **B**.  **C**.  **D**.  **Answer:** _____	

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Educational Assessment Unit – Education Division

FORM 5 **MATHEMATICS (Main Paper – Option B)** **Time: 1h 40min**

1	2	3	4	5	6	7	8	9	10	11	12	13	NC	Main	Total

Name: _____ **Class:** _____

Calculators are allowed but the necessary working must be shown.
Answer all questions.

1. (i) Round each number correct to **1 significant figure** to find an **estimate** of **P**.

$$\mathbf{P} = \sqrt{\frac{47.8 \times 4.2}{1.9}}$$

Estimate = _____

(ii) Use your calculator to work out the value for **P** correct to **1 decimal place**.

P = _____

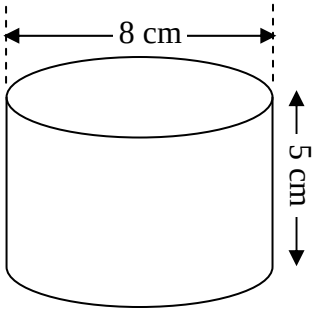
(iii) Write down the **difference** between the answer in (i) and the answer in (ii).

difference = _____

(3 marks)

2. The formula for finding the volume of a cylinder is $V = \pi r^2 h$.

(i) Work out the **volume of the cylinder** shown. Give your answer correct to **1 decimal place**.



Volume = _____cm^3

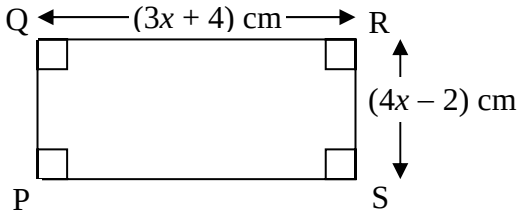
(ii) Make *r* the **subject of the formula.**

r = _____

(4 marks)

3. PQRS is a rectangle.

(i) Write, **in terms of *x***, an expression for the **perimeter** of the rectangle.



Perimeter = _____cm

(ii) The perimeter of the rectangle is 32 cm. Find the value of *x*.

x = _____

(4 marks)

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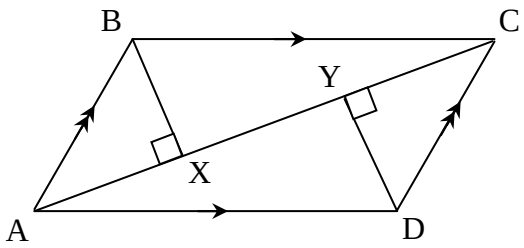
4. (a) ABCD is a **parallelogram**. BX and DY are drawn perpendicular to AC. Prove that triangles ABX and CDY are **congruent**.



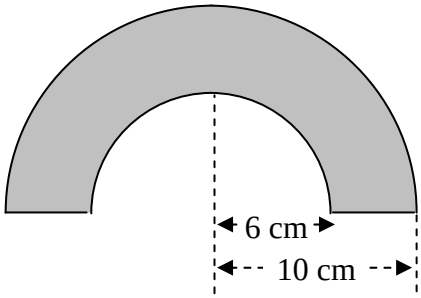
(b) The LOGO statement below draws a **regular pentagon**. Complete the statement.

PD REPEAT _____ [FD 70 RT _____]

(5 marks)

Name: Class:

5. The figure shows two **semi-circular** arcs. The radii of the two arcs are 6 cm and 10 cm.
Work out the **area** of the **shaded region**.
(Give your answer correct to **3 significant figures**.)



Shaded area = _____ cm^2

(5 marks)

6. Joe is using a spreadsheet to help him work out how much he spends at the stationer's. VAT is charged at 18%.

	A	B	C	D	
1	**Item**	**Price (Lm)**	**Quantity**	**Total (Lm)**	
2	File	0.90	3	2.70	
3	Copybook	0.24	5		
4	Total all items (excluding VAT)				
5	VAT (18%)				
6	Total all items (including VAT)				

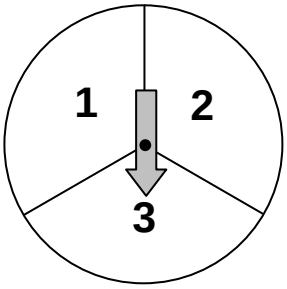
(i) What **formula** did Joe type in cell **D2**? _____

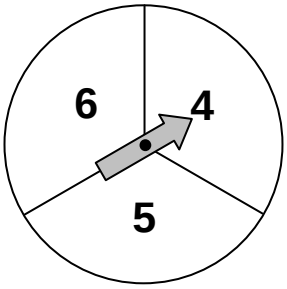
(ii) What **amount** did Joe obtain in cells **D3**, **D4**, **D5** and **D6**? (Give answers correct to the **nearest cent**.)

D3 = _____, **D4** = _____, **D5** = _____, **D6** = _____

(5 marks)

7. Alan has two spinners. The score is the **difference** between the **larger** and the **smaller number**. For example, if 3 comes up on the first spinner and 4 comes up on the second spinner, the score will be 4 – 3 = 1.





(i) Complete the **possibility space** to show all possible outcomes.

		First Spinner		
		1	**2**	**3**
Second Spinner	**4**	3	2	
	5			2
	6			

(ii) Use the possibility space to find the probability that:
(a) the score is 1
(b) the score is an odd number
(c) the score is 3 or more.
(Give your answers as a **fraction.**)

Answer: (a) _____ (b) _____ (c) _____

(7 marks)

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8. (a) **Solve** the equations $\begin{aligned} 3x - y &= 2 \\ x + 7y &= 19 \end{aligned}$

x = _____, y = _____

(4 marks)

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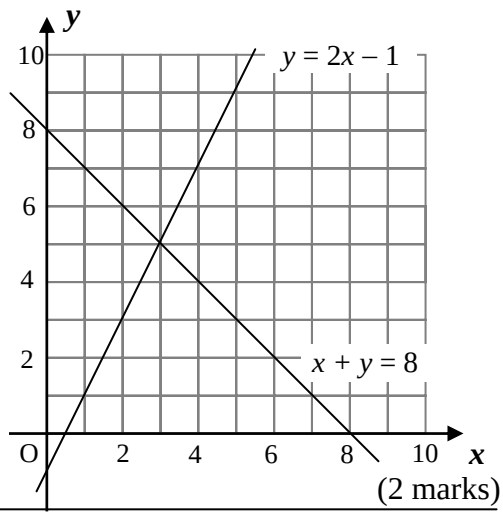
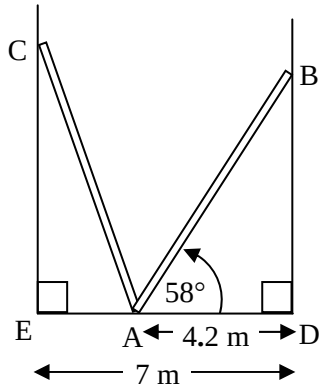
8. (b) Explain how you can **use the graph** to solve the equations $y = 2x - 1$ and $x + y = 8$.



(2 marks)

9. The diagram shows two ladders, AB and AC, resting on horizontal ground DAE in a narrow street that is 7 metres wide. AD = 4.2 metres and ∠BAD = 58°.



(i) Work out the **length of** AB, correct to **2 decimal places**.

AB = _____metres

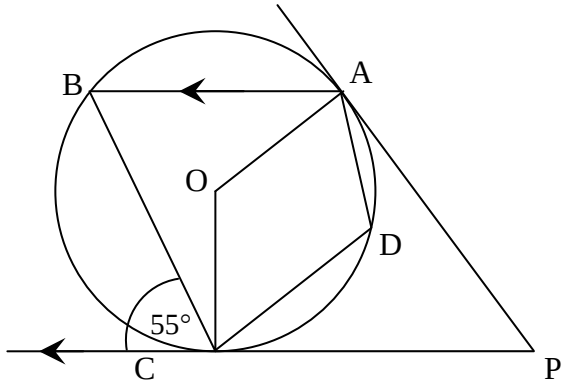
The lengths of the two ladders are **equal**.

(ii) Work out the height of C above the ground, correct to **2 decimal places**.

CE = _____metres

(6 marks)

10. ABCD is a cyclic quadrilateral to the circle with centre O. AP and CP are tangents to the circle.



Write down the size of the following angles, **giving reasons for your answers**.

∠ABC = _____ reason: _____

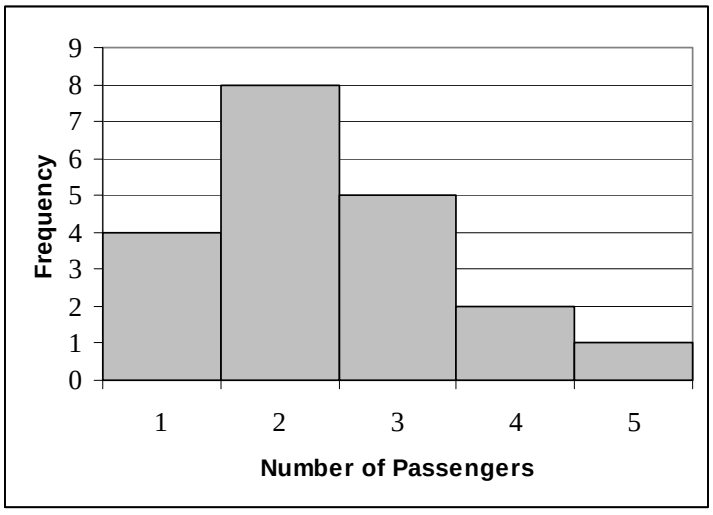
∠AOC = _____ reason: _____

∠ADC = _____ reason: _____

∠APC = _____ reason: _____

(8 marks)

11. (a) Alison counted the number of passengers in cars passing in front of her house. The histogram below shows her results.



(i) How many cars had 3 passengers in them? _____ cars

(ii) Find the **total** number of cars that passed in front of Alison's house.

_____ cars

(3 marks)

11. (b) A small firm employs 10 people. The monthly salaries of nine of the employees are: Lm1000, Lm850, Lm626, Lm620, Lm614, Lm550, Lm550, Lm520, Lm500 The mean salary of the 10 employees is Lm653. Work out

(i) the salary of the remaining employee,

Remaining salary = Lm _____

(ii) the median salary.

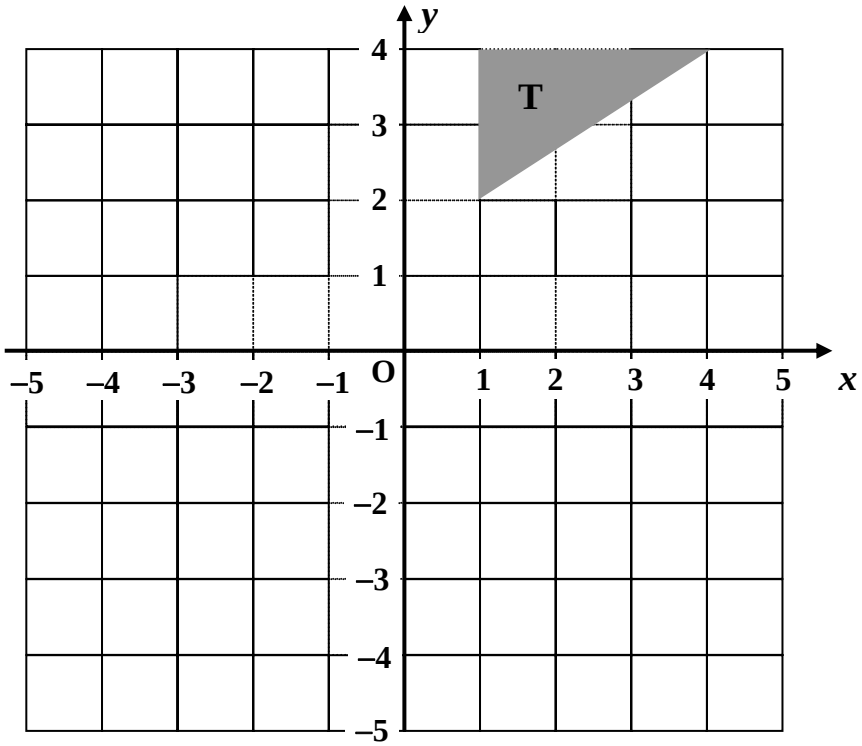
Median salary = Lm_____

(6 marks)

12. (a) T1 is the image of T when it is reflected in the ***y*-axis**. Draw and label T1

(b) T2 is the image of T when it is reflected in the line ***y* = *x***. Draw and label T2.

(c) T3 is the image of T when it is **rotated** through **180°** about **(0, 0)**. Draw and label T3.



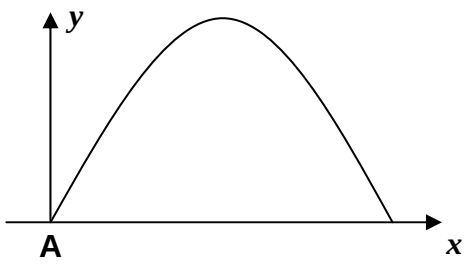
(d) Describe the single transformation that will map T1 to T3.

_____

(8 marks)

13. A goalkeeper kicks a ball from a point A.
The diagram shows the path of the ball.

The equation of the path of the ball is $y = 4x - \frac{x^2}{3}$.



(i) Complete the table for $y = 4x - \frac{x^2}{3}$. (Round the values to 1 decimal place where necessary.)

x	0	2	4	6	8	10	12
$4x$	0	8	16			40	
$-\frac{x^2}{3}$	0	–1.3	–5.3			–33.3	
y	0	6.7	10.7			6.7	

(ii) On the graph paper provided, draw the graph of $y = 4x - \frac{x^2}{3}$. Use 1 cm for 1 unit on both axes.

(iii) Use your graph to find:
(a) the **maximum height** of the ball,

Maximum height = _____ metres

(b) the **value of *x*** when the ball falls back to the ground.

x **= _____**

(10 marks)

Name: Class: