

SECONDARY SCHOOL ANNUAL EXAMINATIONS 2005

Educational Assessment Unit – Education Division

FORM 4

MATHEMATICS (NON-CALCULATOR PAPER)

TIME: 20 min.

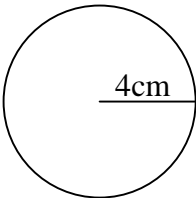
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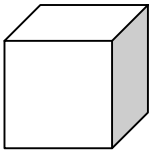
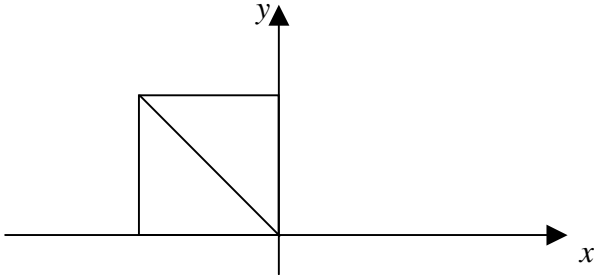
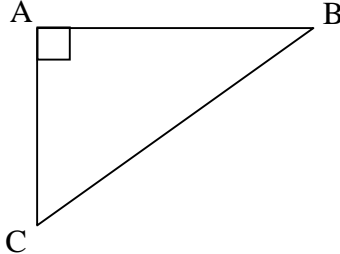
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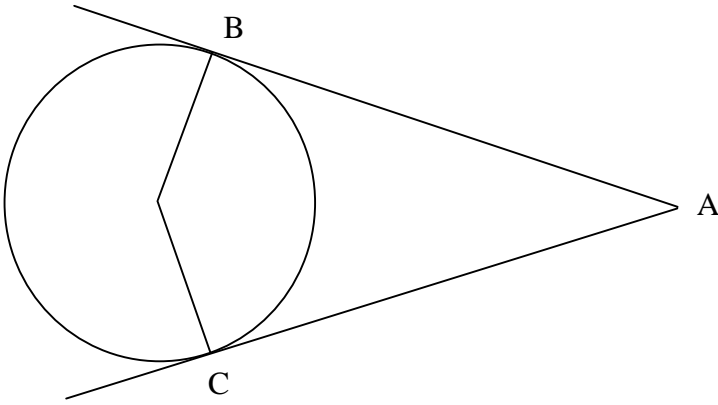
Mark

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.**
- **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 PAPER-AND-PENCIL).**
- **YOU ARE NOT REQUIRED TO SHOW YOUR WORKING. HOWEVER SPACE FOR WORKING IS PROVIDED IF YOU NEED IT.**

	Questions	Space for Working (if required)
1.	Estimate: 98.3×51.1 . Ans: _____	
2.	Evaluate: $5^2 \times 6^0$. Ans: _____	
3.	John takes 1 hour to paint a room. If John and his brother paint a similar room at the same rate, how long will it take them to finish the job? Ans: _____	
4.	My father invested Lm1000 at 2% interest per annum. How much interest does he get after one year? Ans: _____	
5.	Calculate the speed for a journey of 6 km in 2 hours. Ans: _____	
6.	The exchange rate for the euro is Lm 1 \equiv € 2.43 . How many euro do I get for Lm100? Ans: _____	
7.	Take $\pi = 3$. The radius is 4cm. Estimate the circumference of this circle.  Ans: _____	
8.	What is the angle between North East and North West ? Ans: _____	

9.	<p>A cubic container has a volume of 1000 cm^3. How many litres does it hold?</p>  <p style="text-align: right;">Ans: _____</p>	
10.	<p>Find one exterior angle of a regular hexagon.</p> <p style="text-align: right;">Ans: _____</p>	
11.	<p>Draw the reflection of this shape in the y-axis.</p> 	
12.	<p>Fill in:</p> <div style="display: flex; align-items: center; justify-content: space-around;"> <div style="text-align: center;"> $\sin C = \frac{AB}{\square}$ </div> <div>  </div> </div>	
13.	<p>What formula should I write when using a spreadsheet if I want to divide cell A2 by cell B2?</p> <p style="text-align: right;">Ans: _____</p>	
14.	<p>What is the probability that I win if I have 5 tickets in a lottery when 200 tickets are sold?</p> <p style="text-align: right;">Ans: _____</p>	

15.	 <p>AB and AC are tangents to the same circle. When AB is 10cm, how long is AC?</p> <p style="text-align: right;">Ans: _____</p>	
16.	<p>What shape does this LOGO program draw? PD REPEAT 4[FD 100 RT 90]</p> <p style="text-align: right;">Ans: _____</p>	
17.	<p>Factorize: $6x^2 + 2x$.</p> <p style="text-align: right;">Ans: _____</p>	
18.	<p>Solve the equation: $2a + 6 = 10$.</p> <p style="text-align: right;">Ans: _____</p>	
19.	<p>We can write x^{-1} as:</p> <p>(a) $-x$ (b) $\frac{1}{x}$ (c) $x - 1$ (d) $1 - x$</p> <p style="text-align: right;">Ans: _____</p>	
20.	<p>An equation of a straight line is $y = 4x - 3$. What is its gradient?</p> <p style="text-align: right;">Ans: _____</p>	

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FORM 4

MATHEMATICS (Main Paper)

TIME: 1h 40min.

Question	1	2	3	4	5	6	7	8	9	10	11	12	Total Main	Non Calculator	Global Mark
Mark															

DO NOT WRITE ABOVE THIS LINE

Name : _____

Class : _____

CALCULATORS ARE ALLOWED

ANSWER ALL QUESTIONS.

1. (a) Use your calculator to work out the following.
Give your answer correct to 3 significant figures.

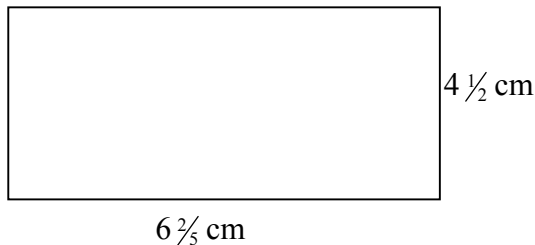
(i) $\frac{2.53}{(3.61 \times 2.52)}$

Ans: _____

(ii) $\sqrt[3]{8.3 \times 2.5}$

Ans: _____

- (b) Thomas has a picture measuring $4\frac{1}{2}$ cm by $6\frac{2}{5}$ cm. Calculate the perimeter of the picture. Leave your answer as a mixed number.



Ans: _____

7 marks

2. (a) Work out, giving your answer in **index form**.

(i) $(6^3)^2$

Ans: _____

(ii) $5^9 \div 5^4$

Ans: _____

(b) **Evaluate:**

(i) 3^{-2}

Ans: _____

(ii) 12^0

Ans: _____

(c) (i) A Lm5 note is 0.00022 m thick. Write this thickness in **standard form**.

Ans: _____

(ii) Write 6.25×10^4 as an **ordinary number**.

Ans: _____

6 marks

3. A sports shop is holding a winter sale and gives **20% reduction** on all items. A spreadsheet is used to work out bills. One bill is as follows:

	A	B	C
1	Item	Unit Price (Lm)	Sale Price (Lm)
2	T-shirt	18	
3	Shoes	25	
4	Tracksuit	32	
5	TOTAL		

(a) What formula is used in cell C2 to work out the **sale price** of a T-shirt?

= _____

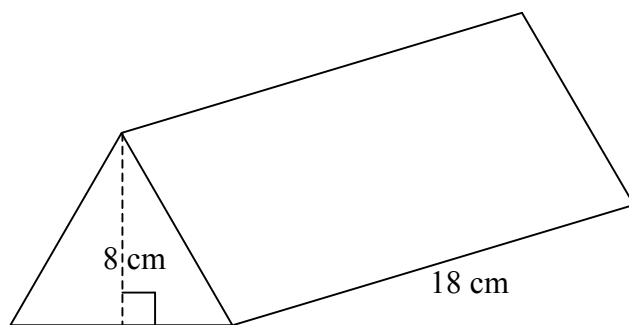
(b) What formula is used in cell C5 to work out the **total** of the bill?

= _____

(c) Work out the **sale price** of the three items and the **total cost** of the bill. Fill in the **answers in the table**.

7 marks

4.



The area of the cross-section of a triangular prism is 16 cm^2 . It is 8 cm high and 18 cm long.

- (a) Find the length of the **base of the cross-section** in centimeters.

Ans: _____

- (b) Calculate the **volume** of the prism in cm^3 .

Ans: _____

6 marks

5. Ship B is sailing on a **bearing 060°** from Ship A. Ship C is 4.2 km due **south** of Ship B and 7.3 km due **east** of Ship A.

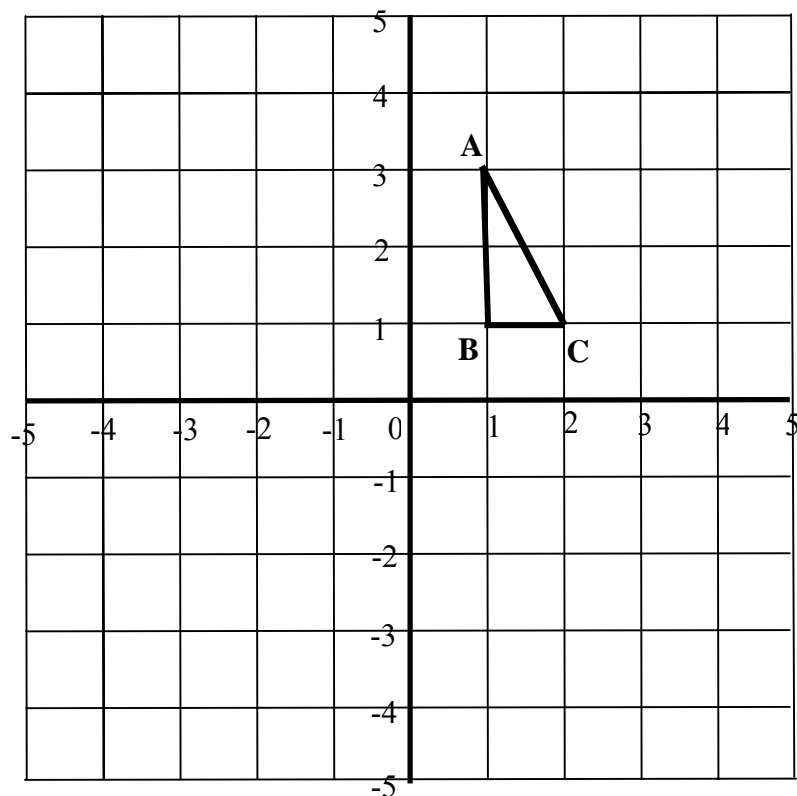
- (a) **Draw a sketch** to show the position of the three ships.

- (b) **Work out** the distance of Ship B from Ship A, correct to the nearest kilometre.

Ans: _____

7 marks

6.

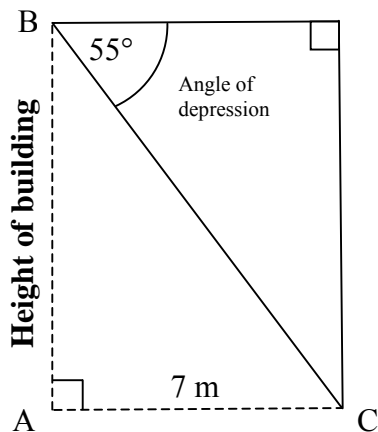


On the diagram above:

- Rotate** triangle ABC through 180° about (0,0). Label the triangle A'B'C'.
- Translate** triangle A'B'C' by the vector $\begin{pmatrix} 3 \\ 0 \end{pmatrix}$. Label the image A''B''C''.
- Enlarge** triangle ABC by **scale factor 2** using (0,1) as centre of enlargement. Label the image A'''B'''C'''.

7 marks

7.

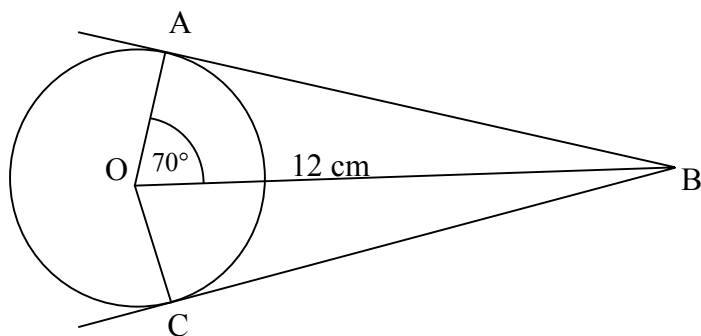


The angle of depression from the top of a vertical building, B, to a point C on the ground is 55° . If C is 7 m from the foot of the building, calculate the height of the building correct to the nearest metre.

Ans: _____

4 marks

8.



AB and BC are tangents to the circle with centre O.

Angle $AOB = 70^\circ$

Side $OB = 12 \text{ cm}$.

(a) Fill in, giving reasons for your answers.

(i) Angle $OAB =$ _____. Reason: _____

(ii) Angle $AOC =$ _____. Reason: _____

(iii) Angle $ABO =$ _____. Reason: _____

(b) Calculate, giving your answers correct to 2 decimal places.

(i) **side AB**

Ans: _____

(ii) **the radius** of the circle.

Ans: _____

12 marks

9. (a) Denise is 5 years older than Thomas.
 (i) How old is Denise when Thomas is 6 years old?

Ans: _____

- (ii) Make a formula for Denise's age, y years, when Thomas is x years old.

Ans: _____

- (b) $a = 2b + c$.
 Find a when $b = 3$ and $c = -2$.

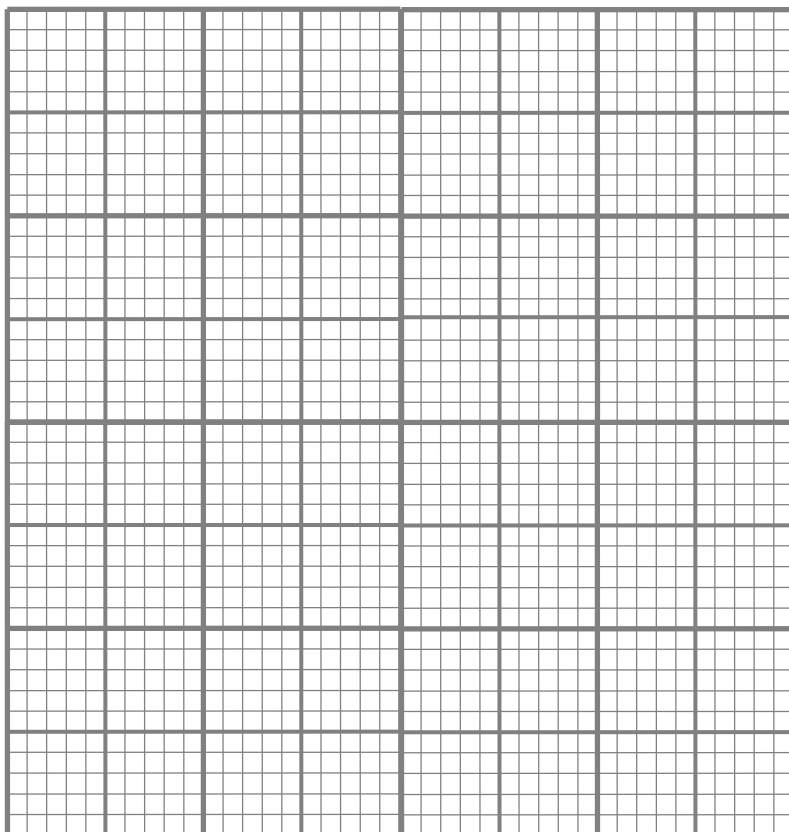
Ans: _____

- (c) Make q the subject of the formula.
 $p = qr - s$.

Ans: _____

7 marks

10. (a) On the grid below, draw suitable axes and plot the points A(-1,1) and B(2,4).
 Join them.



(b)

Draw suitable axes and plot the points A(-1,1) and B(2,4). Join them.

(c)

What are the co-ordinates of the y-intercept of the line.

Ans: _____

Work out the gradient of the line AB.

(d)

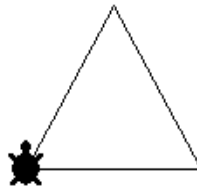
Ans: _____

Write down the equation of this line in the form $y = mx + c$.

Ans: _____

7 marks

11.



Write down a **LOGO** program for the turtle to draw the **equilateral triangle** shown above of side 100 turtle steps. Start your program with PD.

4 marks

12. A number of persons took part in a lottery. The table shows the number of tickets bought by each person.

Number of tickets	1	2	3	4	5
Frequency	6	4	5	2	3

- (a) How many tickets were sold?

Ans: _____

- (b) How many persons took part in the lottery?

Ans: _____

- (c) Work out the **mean** number of tickets bought by each person in the group. Give your answer correct to 1 decimal place.

Ans: _____

6 marks

END OF PAPER