



FORM 3

MATHEMATICS
Main Paper

TIME: 1 hr 30 mins

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	Total Main	Non Calc	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) Round each number to 1 significant figure to estimate the value of:

$$\sqrt{0.94 + 19.99 \times 4.37}$$

Ans: _____

(b) Use your calculator to find the value of $\sqrt{0.94 + 19.99 \times 4.37}$ giving your answer correct to:

(i) 3 significant figures

(ii) 3 decimal places

Ans: _____

Ans: _____

(4 marks)

2. (a) Expand the following and simplify where possible:

(i) $2ab(3 + 4a - 7b)$

(ii) $5x(x + 3y) - 2(3xy - 4)$

Ans: _____

Ans: _____

(b) Expand: $(x - 7)(x + 3)$

Ans: _____

(8 marks)

3. After 18 months, the simple interest earned on €12 000 was €540.

(a) Work out the rate per annum.

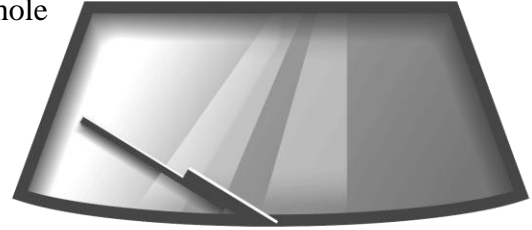
Ans: _____%

(b) For how long would the same amount with the same rate earn €1260 simple interest?
Give your answer in years and months.

Ans: ____ years ____ months

(6 marks)

4. A wiper on a car windscreen covers a **third** of a whole revolution in one swipe.



- (a) Find the area covered by the wiper in one swipe if its length is 45cm. Give your answer in cm^2 and correct to the nearest whole number.

Ans: _____ cm^2

- (b) On another car windscreen, a 50cm-long-wiper covers 100° from a whole circle. What area does it cover in m^2 and correct to 2 decimal places?

Ans: _____ m^2

(8 marks)

5. (a) Factorise completely:

$$16p^5q^3 + 24p^2q$$

Ans: _____

- (b) Simplify:

(i) $(2x^2)^3 \div (2x^3)^2$

(ii) $\frac{15a^2}{4b^3} \times \frac{2ab^6}{27a^4}$

Ans: _____

Ans: _____

(8 marks)


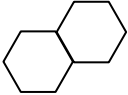
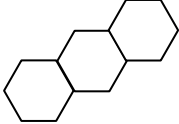
6. Two remote-controlled cars set off from the same position. After a short time, one has travelled 20 m due north and the other 17 m due east. How far apart are the two cars? Give your answer correct to 1d.p.



Ans: _____ m
(4 marks)

7. A path is made using regular hexagonal tiles. Each side is 1 metre long.

(a) Draw the next stage

			
Stage 1	Stage 2	Stage 3	Stage 4

(b) Complete the following table showing the perimeter of the first five stages.

Stage	1	2	3	4	5
Perimeter					

(c) Write a formula for the n^{th} term.

Ans: n^{th} term = _____

(d) Find the number of tiles needed to have a perimeter of 50 metres.

Ans: _____ tiles
(6 marks)

8. Pastry is made with twice and a half flour as there is fat by weight.

(a) What is the ratio of the weight of the flour to the weight of the fat?

(b) The fat and flour together weigh 560g. How much flour is there in this mixture?

Ans: _____ g

(4 marks)

9. (a) Sandra needs to repair her TV set on site. The technician charges a €30 call-out fee plus €15 for each half hour. If x stands for the number of hours, write an algebraic expression for the repair cost in terms of x .

Ans: _____

(b) Work out how much Sandra pays if the technician takes an hour to repair her TV set.

Ans: € _____

(c) Work out how much Sandra pays if the technician takes an hour and a half to repair her TV set.

Ans: € _____

(8 marks)

10. (a) Each **interior** angle of a **regular** polygon is 135° . Work out:

(i) the size of one **exterior** angle

Ans: _____

(ii) the **number of sides** of the polygon.

Ans: _____ sides

(b) Work out the sum of the interior angles of an 11-sided polygon.

Ans: _____

(c) The four interior angles of a **quadrilateral** are: 130° , $(2x - 20)^\circ$, $(3x - 40)^\circ$ and 90° .
Work out the size of the **smallest angle** of this quadrilateral.

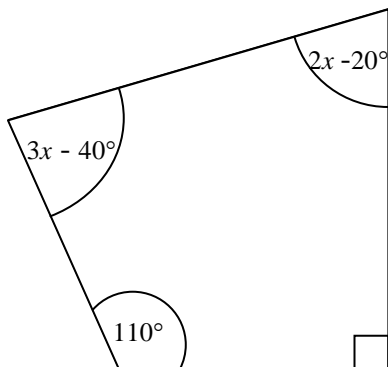


Diagram not to scale

Ans: _____

(7 marks)

11. (a) A Maths test was made up of **20 questions** each carrying equal marks. Jeremy earned a grade of **80%** in this test. How many questions did Jeremy answer correctly?

Ans: _____ questions

11. (b) Pamela bought an electric drill at **85% of the cost price**. She paid €32.89 for the drill.
 What was the cost price? (*Round to the nearest cent*)

Ans: €_____

(4 marks)

12. Continue the table below by using trial and improvement methods to solve the equation $x^3 - 2x = 33$. Give the answer correct to **one decimal place**.

Test	Working	High / Low
$x = 2$	$2^3 - 3(2) = 8 - 6 = 2$	low

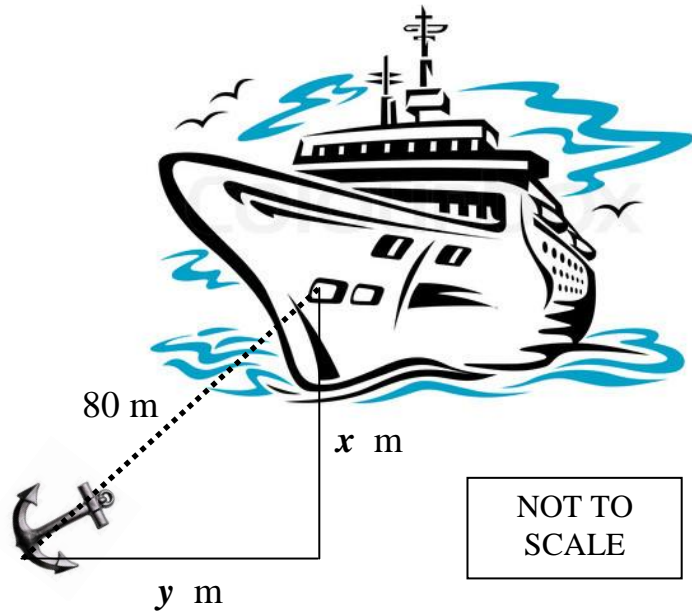
Ans: $x =$ _____

(4 marks)

13. A cruise liner is anchored as shown in the diagram. The cable's length is 80 m and the seabed is 80% of this length down.

(a) Find the length x in metres.

Ans = _____ m



(b) The cruise liner sailed a distance of 150 kilometres for 3 hours and another 220 kilometres for 4 hours. Calculate its average speed for the whole voyage.

Give answer correct to 3dp.

Ans = _____ km/hr

(6 marks)

END OF EXAM