



FORM 4

MATHEMATICS
Main Paper

TIME: 1h 40 mins

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Main	NC	Global Mark
Mark																	

DO NOT WRITE ABOVE THIS LINE

Name: _____

Class: _____

INSTRUCTIONS TO CANDIDATES:

Read all the questions carefully before you start answering.

- Answer all questions.
- This paper carries 80 marks.
- Calculators and mathematical instruments are allowed but all necessary working must be shown.

1. **Evaluate**, giving your answer correct to 1 decimal place.

a) $(3.14 + 6.01)^3$

Ans: _____

b) $\sqrt{\frac{8.6 \times 3.9}{4.1}}$

Ans: _____

c) $3(2\pi)^2$

Ans: _____

(6 marks)

2. Complete this table. The first one is done for you.

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	50%
	0.35	
		110%

(4 marks)

3. On average, a car uses 1 litre of petrol to travel a distance of 6.5 km.
A full tank holds 54 litres of petrol.



a) How many kilometres can a car travel with a full tank?

Ans: _____ km

b) i) Tony visits his mother who lives 338 km away. How many litres of petrol are needed to drive to his mother's house?

Ans: _____ litres

ii) If petrol costs €1.44 per litre, how much does Tony spend on petrol when he drives to his mother's house? Give your answer correct to the nearest euro.

Ans: € _____

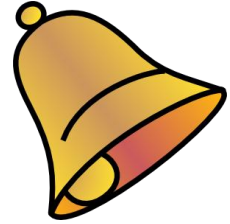
(7 marks)

Name of Student: _____ Class: _____

4. a) Work out the value of $(2.1 \times 10^8) \div (7 \times 10^3)$, giving your answer in standard form.

Ans: _____

b) The bells at St. Mary's church ring every 15 minutes while the bells at St. George's church ring every 20 minutes. If the two bells both **ring together at 6.00 a.m.**, at what time will they next ring together?



Ans: _____ a.m.
(4 marks)

5. Twelve men take 15 days to finish a job if each man works 8 hours a day. If the same job has to be finished in 10 days, find the **total number of extra hours per day** that these 12 men work **altogether**.



Ans: _____ hours
(4 marks)

6. a) **Fill in:**

i) $\frac{5^7 \times 5^{-2}}{5^3} = 5^{\square}$

ii) $101^{\square} = 1$

b) **Simplify:**

$$6x^3 \times 4x^4 \div 8x^2$$

Ans: _____
(4 marks)

7. The formula for converting a temperature in degrees Fahrenheit to degrees Celsius is given by the formula:

$$C = \frac{5}{9}(F - 32)$$

a) A fridge should have a temperature of 41°F. **Convert** 41°F into °C.

Ans: _____ °C

b) The ideal freezer temperature in which to store food safely and stop bacteria from forming is **0°F or colder**. Sandra's freezer is showing a temperature of -15°C. Will bacteria form on the food in her freezer? Show all your working.



Ans: Yes [] No []
(5 marks)

8. a) **Simplify** $5x + 8 + 4y - 3(2 + 4x)$

Ans: _____

b) **Simplify** $\frac{5x+6}{4} - \frac{3x}{12}$

Ans: _____

c) **Solve** $3(x - 5) = 5x - 7$

Ans: $x =$ _____
(8 marks)

9. Trapezium ABCE is right-angled at A and E.

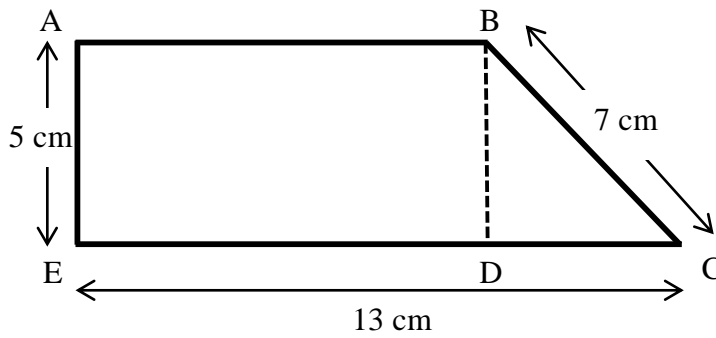


Diagram not drawn to scale.

- a) i) What is the length of side BD? Ans: _____ cm
 ii) Hence, calculate the length of side DC, giving your answer correct to 2 significant figures.

Ans: _____ cm

- b) Find the area of the trapezium ABCE, giving your answer to 2 decimal places.

Ans: _____ cm²
 _____ (7 marks)

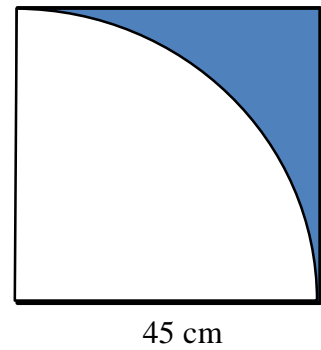
10. (a) Write the numbers 104 and 234 as **products of their prime factors**.

Ans: 104 = _____; 234 = _____

- (b) Hence, work out the **Least Common Multiple** of 104 and 234.

L.C.M. = _____
 _____ (5 marks)

11. The diagram shows a **square** tile of side 45 cm. The pattern on the tile consists of a white quarter circle touching the edges of the square.



a) Calculate the area of the white quarter circle, giving your answer correct to the nearest whole number.

Ans: _____ cm²

b) Calculate the area of the shaded part of the tile, giving your answer to the nearest cm².

Ans: _____ cm²

c) Find the **least** number of square tiles needed to cover a floor 9 m by 3.6 m.

Ans: _____ tiles

(8 marks)

12. A cylindrical hole of radius 1 cm and 6 cm deep is drilled in a cylindrical block of wood of radius 13 cm and height 25 cm, as shown in the diagram below. What is the **volume of the remaining wood**? Give your answer correct to the nearest cm³.

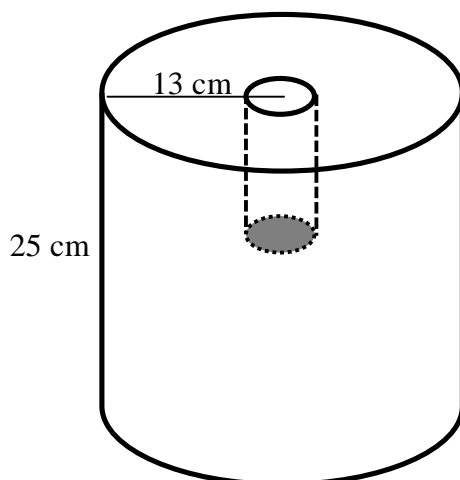
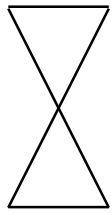


Diagram not drawn to scale.

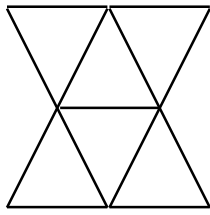
Ans: _____ cm³

(5 marks)

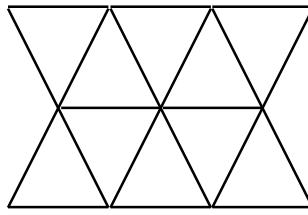
13. Paul makes fences using identical wooden rods each one metre long. Some fences with different lengths are shown below.



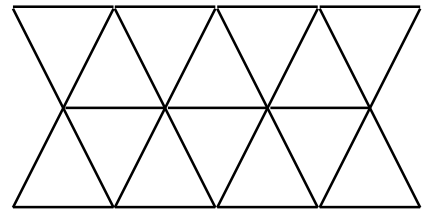
Length = 1 m



Length = 2 m



Length = 3 m



Length = 4 m

The table below shows the number of rods used for various lengths of fence.

Length (metres)	1	2	3	4	6
Number of Rods	6	13	20	<i>a</i>	<i>b</i>

- a) Write down the values of *a* and *b*.

Ans: *a* = _____, *b* = _____

- b) Find an expression for the n^{th} term.

Ans: n^{th} term = _____

- c) Paul has 400 rods. How many **complete** fences of length 6 m can he make?

Ans: _____ fences

(6 marks)

14. From Church A, the bearing of church B is 060° . Church C is 75 km due east of church A and 41 km due south of church B.
- a) Draw a scale drawing to show the position of the three churches. Use a scale of 1 cm to represent 10 km.



b) Use your diagram to calculate:

- i) the actual distance, in km, of church B from church A.

Ans: _____ km

- ii) the bearing of church A from church B.

Ans: _____
°

(7 marks)

END OF PAPER