

Answer ALL TWENTY FOUR questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Here are the first five terms of an arithmetic sequence.

1 5 9 13 17

- (a) Find an expression, in terms of n , for the n th term of this sequence.

.....
(2)

The n th term of another arithmetic sequence is $3n + 5$

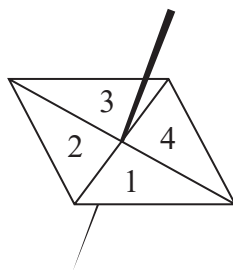
- (b) Find an expression, in terms of m , for the $(2m)$ th term of this sequence.

.....
(1)

(Total for Question 1 is 3 marks)



2 Here is a biased 4-sided spinner.



The table gives the probabilities that, when the spinner is spun once, it will land on 1 or it will land on 3

Number	1	2	3	4
Probability	0.26		0.18	

The probability that the spinner will land on 2 is equal to the probability that the spinner will land on 4

Ravina is going to spin the spinner a number of times.

Ravina works out that an estimate for the number of times the spinner will land on 3 is 45

Work out an estimate for the number of times the spinner will land on 4

.....
(Total for Question 2 is 4 marks)



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- 3 (a) Find the highest common factor (HCF) of 56 and 84
Show your working clearly.

.....
(2)

- (b) Find the lowest common multiple (LCM) of 60 and 72
Show your working clearly.

.....
(2)

(Total for Question 3 is 4 marks)



- 4 The diagram shows parts of three regular polygons, **A**, **B** and **C**, meeting at a point.

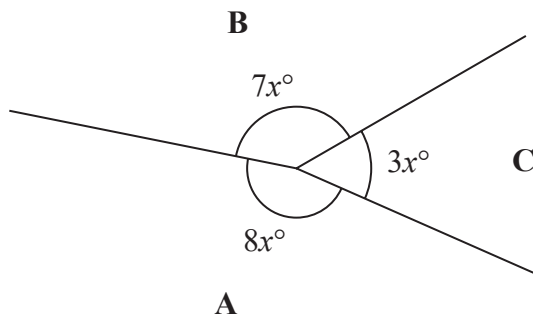


Diagram **NOT**
accurately drawn

Polygon **B** has n sides.

Work out the value of n .

$$n = \dots\dots\dots$$

(Total for Question 4 is 4 marks)

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5 (a) Expand and simplify $(n - 6)(n + 4)$

.....
(2)

(b) Solve $2x - 3 = \frac{3x - 5}{4}$

Show clear algebraic working.

$x =$
(3)

(Total for Question 5 is 5 marks)



6 Asha bought an apartment.

The table gives information about the value of apartments, in euros, and the annual service charge band.

Value (x euros)	Service charge band
$x \geq 700\,000$	A
$600\,000 \leq x < 700\,000$	B
$500\,000 \leq x < 600\,000$	C
$400\,000 \leq x < 500\,000$	D
$0 < x < 400\,000$	E

In 2021, the value of Asha's apartment was 634 400 euros.

The value of Asha's apartment had increased by 4% from its value in 2020

- (a) Has the annual service charge band changed for Asha's apartment?
Show your working clearly.

(3)

Pam bought a boat.

In each year after Pam bought the boat, the value of the boat depreciated by 15%

- (b) Work out the total percentage by which the value of the boat had depreciated by the end of the second year after Pam bought the boat.

..... %

(3)

(Total for Question 6 is 6 marks)



7 A cylinder is placed on the ground.

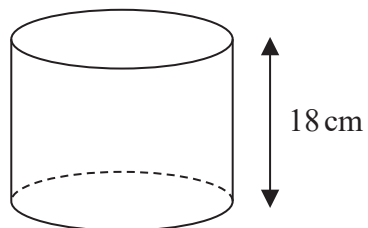


Diagram **NOT**
accurately drawn

The height of the cylinder is 18 cm.

The force exerted by the cylinder on the ground is 72 newtons.

The pressure on the ground due to the cylinder is 1.4 newtons/cm²

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

Work out the volume of the cylinder.

Give your answer correct to 3 significant figures.

..... cm³

(Total for Question 7 is 4 marks)



8 (a) Write 0.000 089 in standard form.

.....
(1)

(b) Write 8.34×10^4 as an ordinary number.

.....
(1)

(Total for Question 8 is 2 marks)

9 (a) Simplify $8 \times (4t)^0$

.....
(1)

$$x^6 \div x^{-5} = x^p$$

(b) Find the value of p

$p =$
(1)

(c) Simplify fully $(2k^2m^4)^3$

.....
(2)

(Total for Question 9 is 4 marks)

