Entrance Examination

MATHEMATICS SPECIMEN PAPER 1

1 hour

PLEASE WRITE YOUR NAME BELOW AND <u>MAKE IT CLEAR!</u>

SURNAME: ………………………………………………......

FIRST NAME: …………………………………………………

SCHOOL: ………………………………………………………..

**This paper contains 25 questions for you to attempt.
If you finish early, check your working carefully.**

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1. (a) Write 1 234 567 in words.

Answer:……………………………………………………………………………………………..

……………………………………………………………………………………………

………………………………………………………………… *[1 mark]*

(b) For the number 1 234 567 what value does the 5 represent?

Answer:………………………………………………… *[1 mark]*

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2. Calculate the following

(a) $(33 + 7) \div (14 - 6)$

Answer: .... *[1 mark]*

(b) $2 \times 9 + 4 \times 2$

Answer: .... *[1 mark]*

(c) $(16 + 40) \div 2 \times 4$

Answer: .... *[1 mark]*

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3. (a) Susan goes on a motoring holiday to France. At the start of her holiday, the number of miles the car has been driven is shown as:
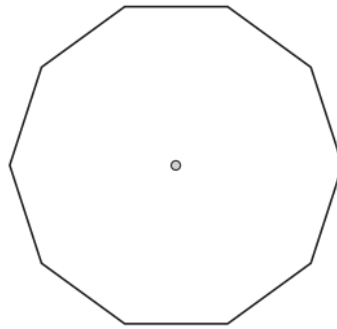
2	7	8	4	9

What is the number 27 849 to the nearest thousand?

Answer: .... *[1 mark]*

(b) On her holiday, Susan drives a total of 1 753 miles.
What is the total number of miles the car will display at the end of the holiday?
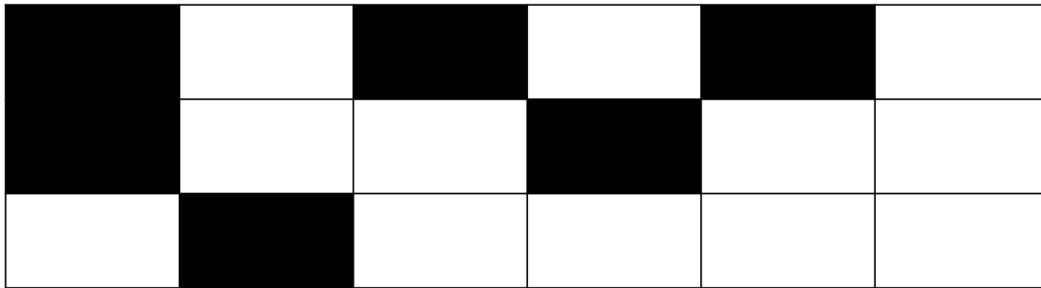
Answer: .... *[1 mark]*

1
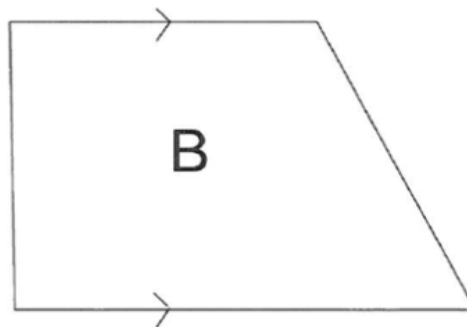
4. (a) By first drawing two lines from the centre, shade 20% of the shape below.

[1 mark]

(b) What fraction of the following shape has been shaded? Give your answer in its *simplest form.*

Answer: .... [2 marks]

_____

5. (a) Which type of quadrilateral is shape B?
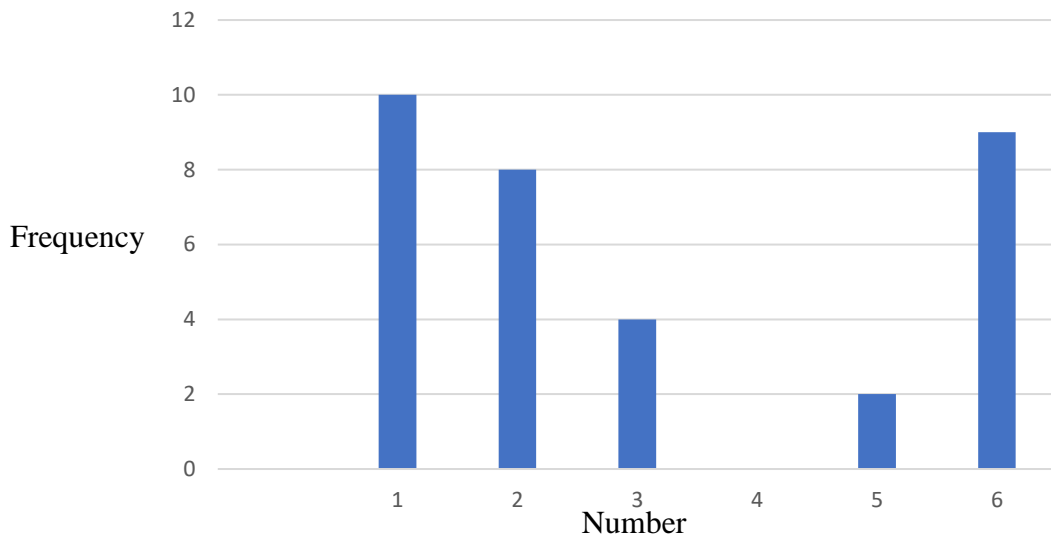
Answer: .... [1 mark]

(b) On the shape B (above), mark with an R, a reflex angle.

[1 mark]

(c) On the shape B (above), mark with an A, the acute angle.

[1 mark]

_____

6. A class were asked to choose a number from 1 to 6. The chart below shows the results.

(a) How many pupils are in the class?

Answer: .... [1 mark]

(b) Which number was picked the least?

Answer: .... [1 mark]

_____

7. The table below shows the record maximum and minimum temperatures ever recorded in the individual nations of the UK.

	Record Maximum	Record Minimum
England	$40°C$	$-26°C$
Northern Ireland	$31°C$	$-19°C$
Scotland	$35°C$	$-27°C$
Wales	$37°C$	$-23°C$

(a) Find the range of the **minimum** temperatures.

Answer: .... °C [1 mark]

(b) Find the mean **maximum** temperature of all 4 nations.

Answer: .... °C [2 marks]

_____

TURN OVER

8. (a) Complete the table below, giving fractions in their simplest form.

Fraction	Decimal	Percentages
	0.75	
$\dfrac{2}{5}$		
		85%

[3 marks]

(b) What number is halfway between 1.9 and 1.992?

Answer: .... [1 mark]

(c) Calculate the following, giving your answer in its simplest form and as a mixed number where appropriate. **You must show all your working**.

(i) $\dfrac{3}{7} + \dfrac{8}{7} + \dfrac{5}{7} + \dfrac{6}{7}$

Answer: .... [2 marks]

(ii) $3\dfrac{8}{9} - 1\dfrac{17}{18}$

Answer: .... [3 marks]

9. (a) Write the following measurements in ascending order:

$$5610\,m \qquad 561\,cm \qquad 0.561\,km \qquad 56100\,mm$$

Answer: ……………………,…………………….,…………………….,…………………… *[2 marks]*

(b) If $1\ inch = 2.5\ cm$ and $1\ kg = 2.2\ lb$, fill in the blanks below:

$$3\ inches = \text{............................}\ cm$$

$$\text{............................}\ kg = \ 6.6lb$$

$$5\ inches = \text{............................}\ mm$$

[3 marks]

_____

10. Use the calculation $\mathbf{24 \times 26 = 624}$ to complete the three boxes.

[3 marks]

_____

5
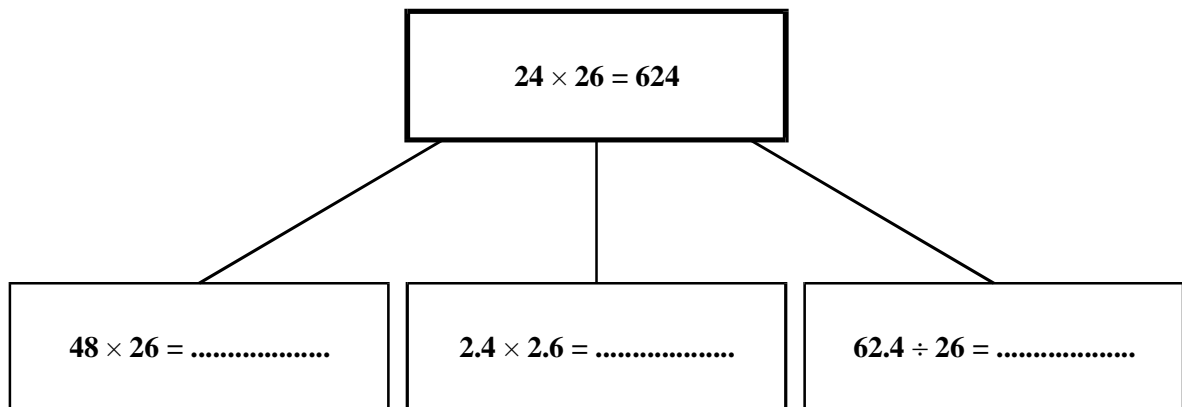
11. Draw **two** rectangles on the grid below, each of which have a perimeter 18 *cm*.
Each rectangle must:

- Not go outside the grid OR overlap with the other rectangle.
- Lie exactly on the lines of the grid.
- Not have a side length that is the same as the other rectangle.

You may assume that each square of the grid is 1 square *cm*.
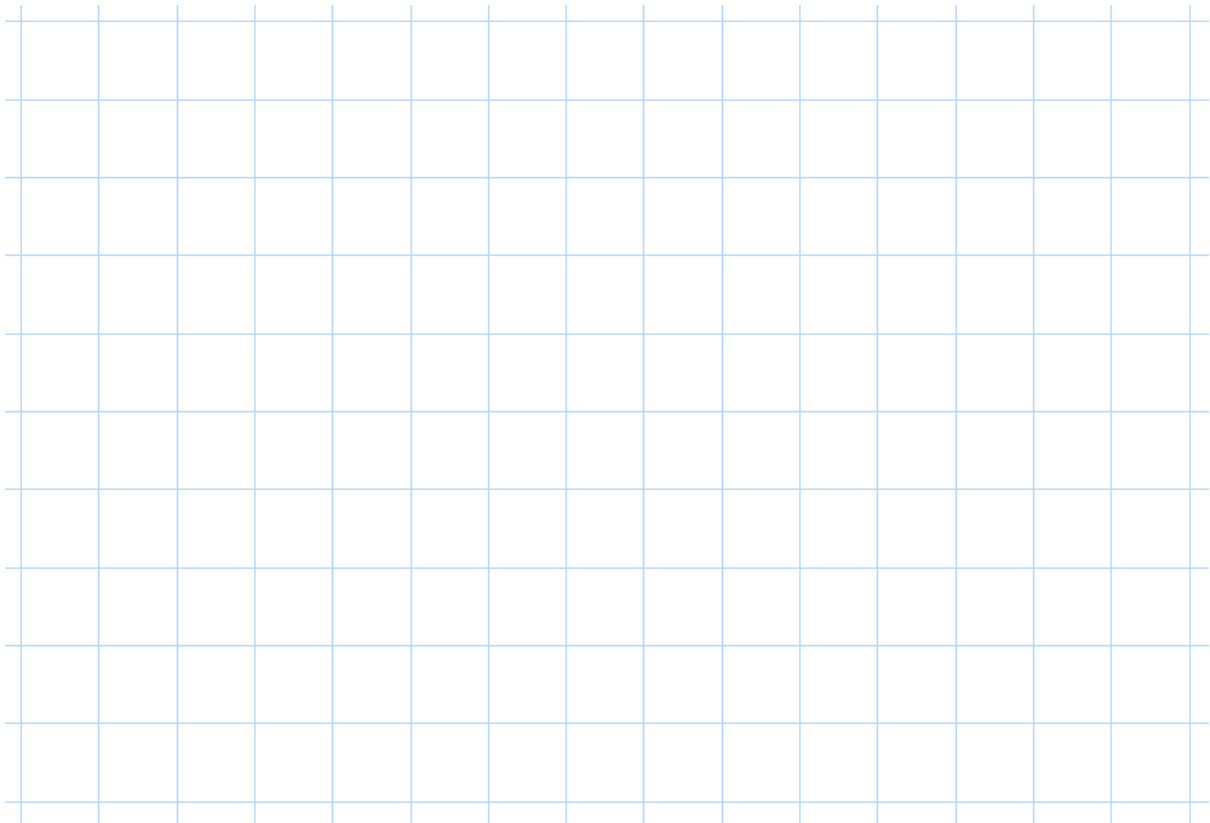
[2 marks]

12. (a) Jack and Jill get to Reading at 2135 and take the next train to Cardiff.
Their train is delayed for 22 minutes between Reading and Bristol and
19 minutes between Bristol and Cardiff.
How long after midnight does their train arrive?

Station	Train 1	Train 2	Train 3
Paddington	2000	2100	2200
Reading	2030	2130	2230
Bristol	2129	2229	2329
Cardiff	2205	2323	0014

Answer: ....minutes [2 mark]

(b) The next day, Jack and Jill walk up a hill. The top of the hill is 450 metres
above sea level. Jack rolls down the hill into a valley. The bottom of the valley
is 200 metres below sea level. How far has Jack rolled?

Answer: ....metres [1 mark]

_____

TURN OVER

13. (a) A lottery win of £435 was shared equally between 15 people. How much did each person receive?

Answer: £............................ [2 marks]

(b) Ellie has £20 to spend at a sweet shop.
She buys 3 bars of chocolate which cost £1.25 each and 400g of pick and mix which costs £3.50 per 100g.
She shares her change equally between her three brothers. How much do they each receive?

Answer: .... [3 marks]

(c) The mean house price of 12 houses in Rickmansworth is £350 000.
Antonio looks at 10 of these houses and the mean price of these 10 houses is £342 000.
What is the mean price of the last 2 houses?

Answer: £............................ [3 marks]

14. Three points A, B, and C have been plotted on the grid below.
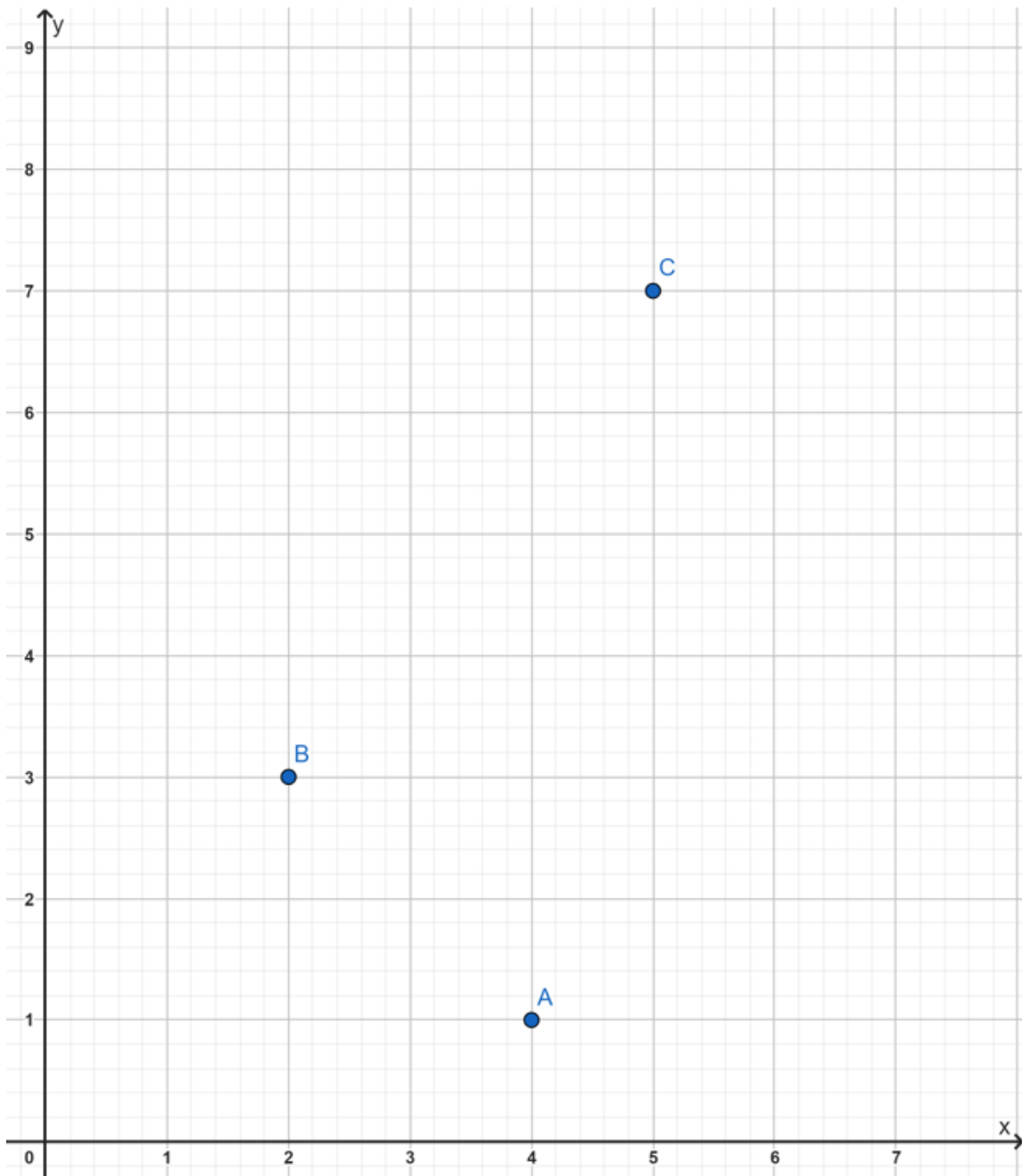
(a) On the grid above, plot a new point and label it **D**, such that shape ABCD is a parallelogram.
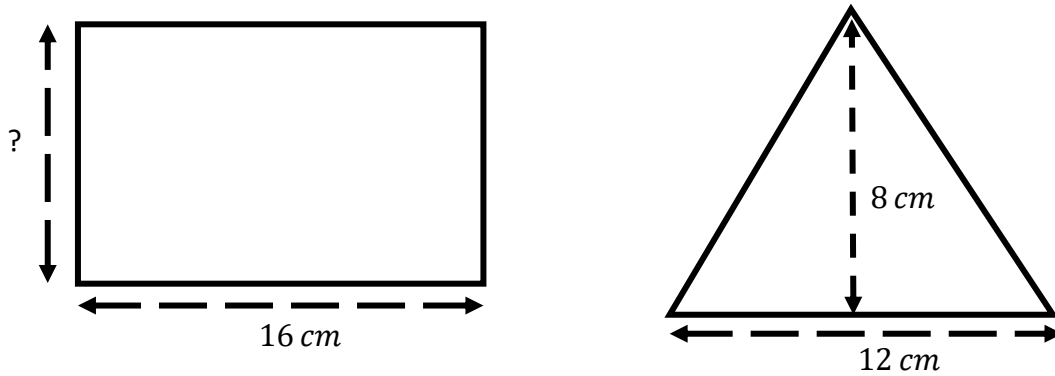
[1 mark]

(b) Write down the coordinates of the point **C**

Answer: (………… , …………)[1 mark]

15. (a) What is the area of a right-angled triangle with a base of $3\,m$ and a height of $5\,m$?

Answer: .... m^2 [1 mark]

(b) The triangle and the rectangle below have the same area. What is the height of the rectangle?

Answer: .... cm [2 marks]

(c) Two rectangles have the same area, $144\,cm^2$.
The length of the second rectangle is three times the length of the first.
The width of the second rectangle is $4\,cm$.
What is the length of the first rectangle?

Answer: .... [2 marks]

(d)   Calculate the area of the following shape:

0.5 *m*

2 *m*

6 *m*

5 *m*
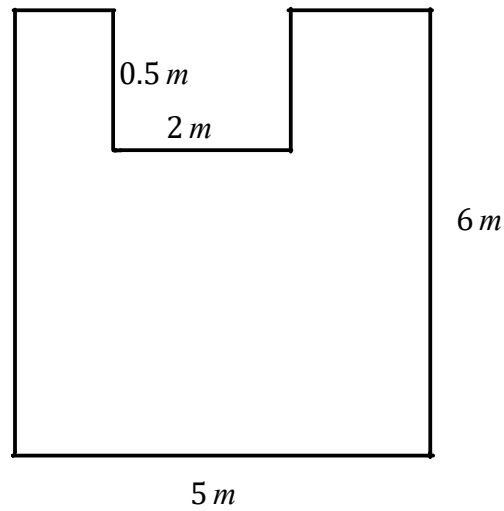
Answer: .... m² [3 marks]

(e)   The solid shape below is made up of 1 cm^3 cubes.
        What is the total volume of the 3D shape?

Answer: ....cm³ [2 marks]

TURN OVER
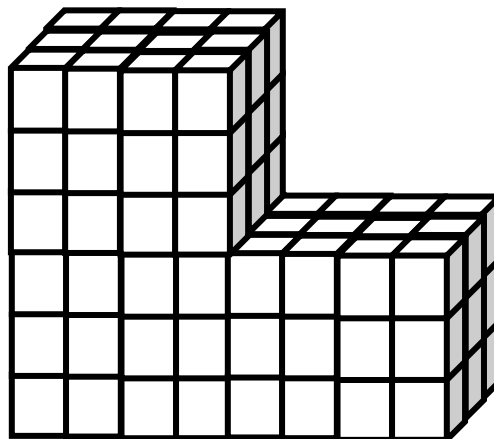
16. (a) What is the largest number that is a factor of both 48 and 64?

Answer: .... [2 marks]

(b) What is the smallest integer that can be divided by 45 and 75 exactly?

Answer: .... [1 mark]

(c) Write down the smallest number which satisfies the following properties:
- it is an even number
- it is a multiple of 5
- it is a square number

Answer: .... [1 mark]

(d) There are four prime numbers between 10 and 20.
Pete adds together two of these prime numbers to get a square number.
What square number does he get?

Answer: .... [1 mark]

(e)   Bob has some marbles.
        If Bob arranges them into piles of 7, there is one marble left over.
        If Bob arranges them into piles of 9, there are three marbles left over.
        What is the smallest number of marbles could Bob have?

Answer: .... [2 marks]

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17.   Steve's van can carry 52 boxes.
        Steve has 2 240 boxes to move from Hampstead to Northwood.
        How many round trips must the van make to transport all of these boxes from
        Hampstead to Northwood?
        You must show full working.

Answer: .... trips [2 marks]

TURN OVER

18. (a)   The diagram shows a triangle and a line. The diagram is not to scale.
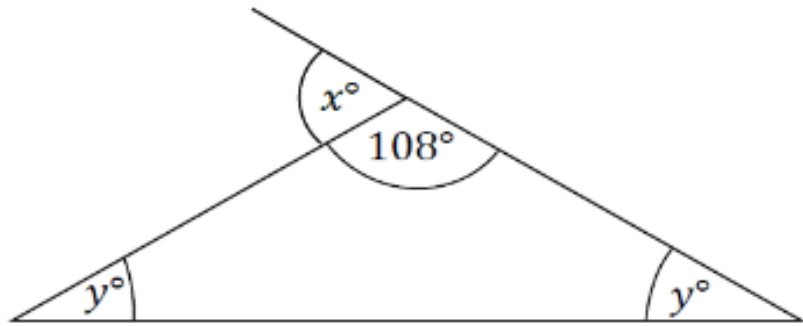
(i)   Work out the value of $x°$.

Answer: .... ° [1 mark]

(ii)   Work out the value of $y°$.

Answer: ....° [1 mark]

(b)   What is the sum of the angles marked in the diagram below?

Answer: .... °[2 marks]

14
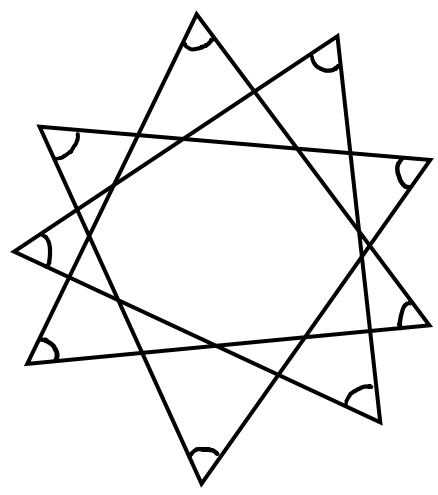
(c) In the diagram below, triangle ABC is equilateral.
Angle $ABE = 35°$, angle $DCE = 20°$. CD and BE are straight lines.
What is the size of the angle marked x?

B
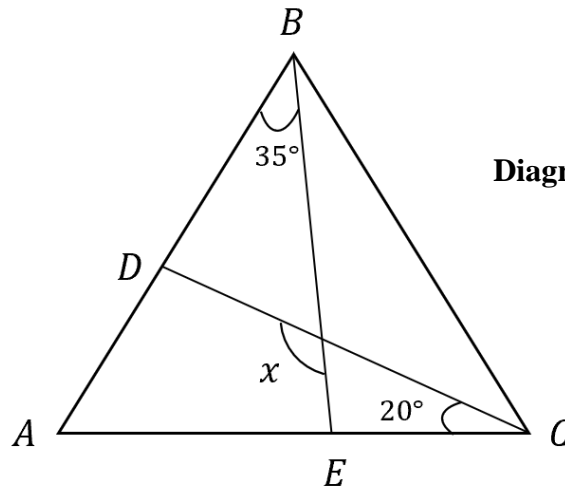
35°   **Diagram not drawn to scale**

D

x

20°

A   C

E

Answer: ....° *[2 marks]*

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19. Amara and Malcolm each think of a number between 1 and 10.

(a) Amara multiplies her number by 5, subtracts 3 and gets an answer of 42.
What is Amara's number?

Answer: .... *[1 mark]*

(b) Malcolm squares his number and then divides it by 9. He gets a result of 4.
What is Malcolm's number?

Answer: .... *[1 mark]*

15

20. (a) In the town of Mathseyland there are 400 residents.
45% of the residents are children, the rest are adults.
How many adults are there in Mathseyland?

*Answer:* .... *[2 marks]*

(b) Digit Town Primary School has 150 pupils.
69 of these pupils are boys.
What percentage of the pupils are boys?

Answer: .... *% [2 marks]*

(c) Football is very popular in Digit Town.
Two fifths of the population support Mathletic United.
The rest support either Counting City or Mathsvilla.
Twice as many people support Counting City than support Mathsvilla.
500 people support Mathsvilla.
What is the total population of Digit Town?

Answer: .... *[2 marks]*

21. The shapes below represent three distinct consecutive integers. The sum of each row and column is shown below. Find the missing value in the first column.

△	△	○	22
□	△	□	25
○	□	○	25
	23	25	■

Answer: .... *[2 marks]*

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22. The range of 5 numbers is 11, the median, mode and mean are 6. If the smallest number is 1 find the other four numbers.

Answer: ...., ..., ..., ... *[3 marks]*

TURN OVER

23. Lowri and Rhys attend neighbouring schools.
Lowri's school has 736 students and 64 teachers.
Rhys' school has 968 students and 88 teachers.
Which school has the higher student to teacher ratio?
You must explain your answer.

Answer:……………………………………………………………………………………………

………………………………………………………………………………… [2 marks]

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24. A sequence decreases by the same amount each time.
The 3rd term is 20 and the 8th term is a quarter of the 3rd term.

(a) Which is the first term to go below zero?

Answer: .... [3 marks]

(b) Which **term** is $\frac{4}{13}$ of the first term?

Answer: .... [3 marks]

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25. Plantain chips are on sale in two different shops.
Each packet of chips weighs 75 *g* and costs 50 pence.
Two shops are offering promotions when you buy 20 or more packets.
Jorge is going to purchase 20 packets of plantain chips for his party.

Shop A offers 20% off the total price when Jorge buys 20 packets of plantain chips.

Shop B offers 22% extra chips when Jorge buys 20 packets.

Shop A
Plantain
chips
20% off

Shop B
Plantain
chips
22% extra
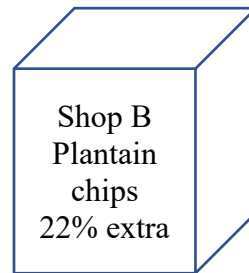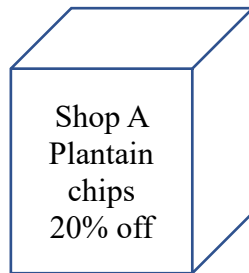
Which shop offers the best value for money?
You must explain your answer.

Answer:……………………………………………………………………………………………

………………………………………………………………………………… *[4 marks]*

END OF EXAMINATION
NOW CHECK YOUR WORKING

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