MERCHANT TAYLORS'

School

Entrance Examination

MATHEMATICS
SPECIMEN PAPER 2

1 hour

**This paper contains 30 questions for you to attempt.
If you finish early, check your working carefully.**

1.   The average salary in the UK is £36 611.

(a)   Write 36 611 in words.

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

(b)   Round this number to the nearest thousand pounds.

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

(c)   Write each of the digits 1, 5, 6, 9 once, so that the resulting number is closest to six thousand.

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

_____

2.   Calculate the value of the following:

(a) 3132×12

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

(b) $3132 \div 12$

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

_____

3.   (a)   Match each description of an object to the amount of liquid it can hold.

330 ml   5 ml   5 litres   1 litre

A bottle of milk:...........................

A bucket: ....

A teaspoon: ....

A can of fizzy drink: ....

[2 marks]

(b)   Arrange these distances in size order, from **smallest to largest**.

250 m   0.52 km   0.5 km   2.05 km   502 m

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

_____

4.   Alim draws a plan of his school using a scale where 1 cm on his plan represents 12 m in the school.

(a)   On the plan, the vegetable garden is 2 cm wide.
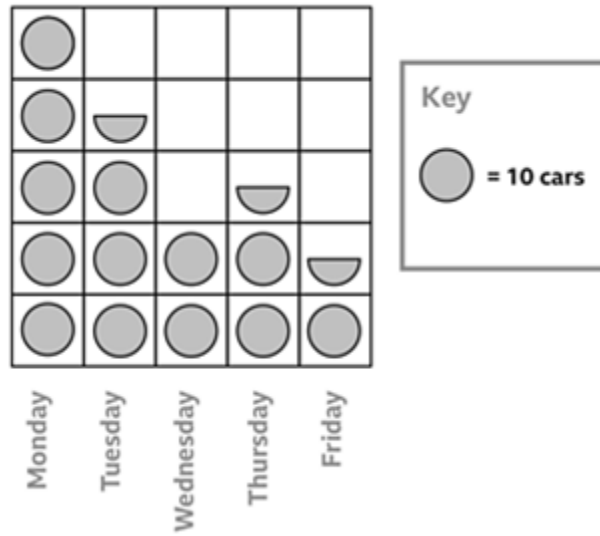   What is the real width of the vegetable garden?

Answer: .... [2 marks]

(b)   The school hall is 54 m long.
        How long is the hall on the plan?

Answer: .... cm [1 mark]

_____

2

5. The pictogram below shows information about the number of cars that Sally sees on her way to school in a week.

Key

◯ = 10 cars

Monday
Tuesday
Wednesday
Thursday
Friday

(a) How many cars did she see on Thursday?

Answer: .... [1 mark]

(b) Sally says she saw 55 cars in total on 2 consecutive days. Which 2 days was she talking about?

Answer: .... and .... [1 mark]

(c) What is the mean number of cars she saw per day in that week?

Answer: .... [2 marks]

6. The table shows the distances in miles between places in the West of the United Kingdom.

Barnstaple

100	Bristol			
55	84	Exeter		
108	194	110	Penzance	
67	125	44	77	Plymouth
50	51	35	144	75	Taunton

(a) One of the places is 194km from Penzance. Which place is this?

Answer: .... [1 mark]

(b) Approximately how many times further is Exeter from Penzance than it is from Taunton?

Answer: .... [2 marks]

_____

7. Work out:

(a) $45 - (10 \div 2) \times 7$

Answer: .... [1 mark]

(b) $12 - (4 + 2 \times 8) \div 5$

Answer: .... [1 mark]

_____

4

8. The table below shows the maximum and minimum temperatures for five countries.

Country	Maximum Temperature	Minimum Temperature
Australia	38°C	−2°C
Iceland	18°C	−12°C
Malaysia	34°C	18°C
Spain	29°C	−6°C
Tunisia	31°C	1°C

(a) Which country had the lowest temperature?

Answer: .... [1 mark]

(b) What was the difference between the maximum and minimum temperature in Spain?

Answer: ....°C [1 mark]

(c) Which country had the biggest difference between the maximum and minimum temperatures?

Answer: .... [1 mark]

---

9. Squash is made from cordial and water.
To make eight 200 ml glasses of squash, Matthew needs 320 ml of cordial, the remainder is water.

(a) How much water does he need to make eight glasses of squash?

Answer: ....ml [1 mark]

(b) How much cordial does he need to make three glasses of squash?

Answer: ....ml [1 mark]

5

10. Jenny is thinking of a number. When she multiplies her number by 2 and then adds 1 she gets the same total as if she had multiplied her number by 3 and then subtracted 4.

What number was Jenny thinking of?

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

---

11. What is the value of:

(a) $\frac{1}{25} + 0.2$ Write your answer as a fraction.

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

(b) $\frac{12345}{1+2+3+4+5}$ Write your answer as a whole number.

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

(c) $201 \times 9 - 102 \times 9$

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

---

12. Here are a rectangle and a square.

12 cm

$Area = 72$ cm^2

Diagrams **not** drawn accurately.
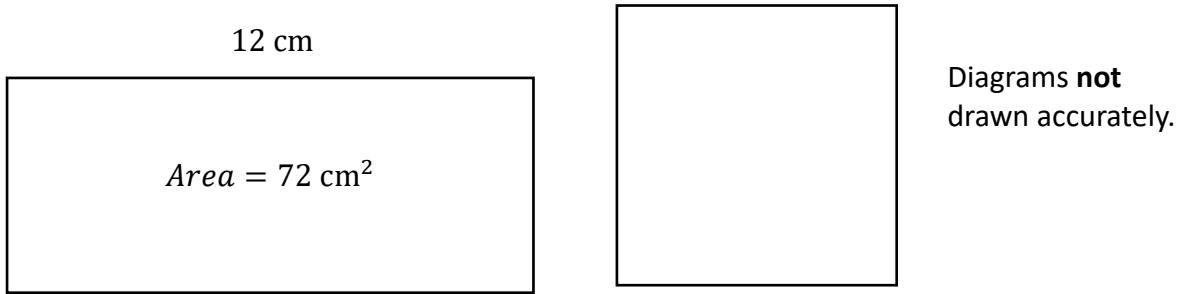
The rectangle has length 12 cm and area 72 cm^2.
The perimeter of the square is the same as the perimeter of the rectangle.

Calculate the area of the square.

Answer: ....cm^2 [3 marks]

13.   (a)   Sahara Shipping made a profit of £40 000 in 2020. They pay tax on this at a rate of 20%. How much tax will they need to pay?
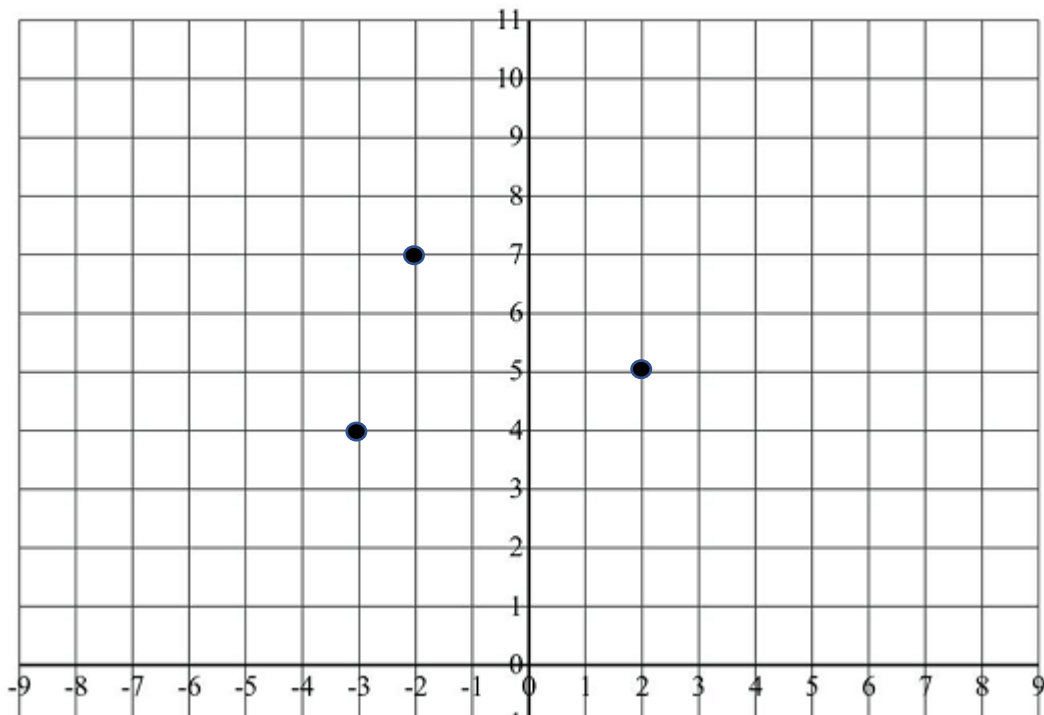
Answer: £............................ [1 mark]

(b)   The tax authorities discover that Sahara Shipping have underpaid tax and have fined them 6% fine of their £40 000 profit. How much is the fine?

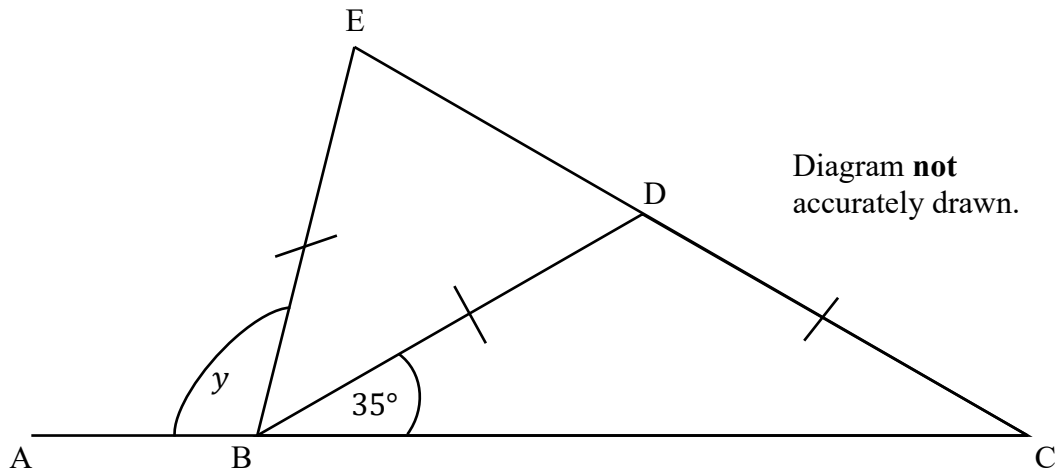*Answer: £............................ [2 marks]*

14.

Janice wishes to place a fourth dot on this coordinate grid to create a parallelogram. She discovers that she has three sets of coordinates which will provide this result. Write down two sets of coordinates which Janice can use.

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

15.

Diagram **not** accurately drawn.

(a)   What kind of triangles are triangle BCD and triangle BDE?

Answer: .... [1 mark]

(b)   What is the value of y?

Answer: y = ...° [3 marks]

16. Jaasvin buys 30 kg of sweets to sell at the MTS summer fair, the profits of which will be donated to charity. He pays £46 for the sweets.
Jaasvin puts all the sweets into bags. He puts 250 g of sweets into each bag. He sells each bag of sweets for 70p.
Jaasvin sells all of the bags of sweets.

Work out how much money Jaasvin gives to charity.

Answer: £ .... [3 marks]

___

17. The photograph shows three Russian dolls.

The real life height of the **largest** Russian doll is **13.5 cm**.
What is the real life height of the **smallest** Russian doll?
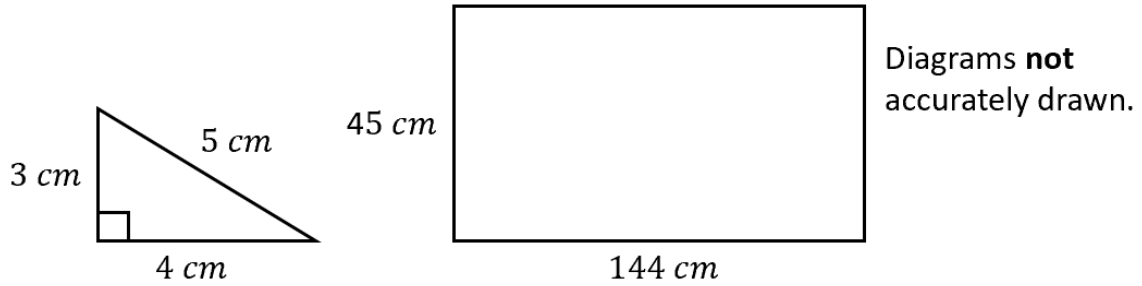
Answer: ....cm [2 marks]

___

18. (a) Alan, Ben and Christopher were discussing their breakfast choices. They discovered that Alan eats muffins every 9 days, Ben eats muffins every 12 days and Christopher eats muffins every 8 days for breakfast.
If they all ate muffins on 1st January, what is the next date when they will all eat muffins on the same day?
(You may assume that this year is not a leap year)

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

(b) Barry has bought some croissants for his friends for breakfast. He has 42 plain croissants, 60 chocolate croissants and 90 almond croissants.
He wants to divide them into identical bags using all of the croissants.
What is the largest number of bags he can make?

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

19. A puzzle is composed of identical right-angled triangles with side lengths 3 cm, 4 cm and 5 cm. These must be arranged into a wooden frame of length 144 cm and width 45 cm.

5 cm

3 cm

4 cm

45 cm

144 cm

Diagrams **not** accurately drawn.

(a) What is the area of a single triangle?

Answer: .... cm² [1 mark]

(b) How many triangles are needed to perfectly fill the wooden frame?

Answer: .... [2 marks]

(c) What is the total perimeter of all the triangles used?

Answer: .... cm [2 marks]

20. (a) A bag contains only red counters and blue counters. There are 90 red counters in the bag. The probability of choosing a red counter from the bag is 30%. How many blue counters are in the bag?

Answer: .... [2 marks]

(b) Another bag contains only red, blue and green counters. There are 60 blue counters in the bag. The probability of choosing a red counter is $\frac{1}{4}$ and the probability of choosing a blue counter is $\frac{1}{3}$.
How many red counters are in the bag?

Answer: .... [2 marks]

_____

21.   (a)   The sum of three consecutive **odd** numbers is 57. What is the smallest of these numbers?

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

(b)   Two numbers add to 93. One of the numbers is twice as large as the other number.
What is the product of the two numbers?

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

_____

22.   Look at the sequence below:

5   11   17   23   29   35 …..

If the sequence carried on, would 209 be included in the sequence?
You must show working to justify your answer.

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

……………………………………………………………………………………………………

……………………………………………………………………………………………………

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

_____

23. (a) How many minutes are between 10:13 am and 2:37 pm on the same day?

Answer: .... minutes [1 mark]

(b) The distance between Banagher and Sligo in Ireland is 128 km.
It takes Darragh 7200 seconds to drive from Banagher to Sligo.
Darragh knows:

"To convert kilometres to miles, you divide by 8, then multiply by 5."

Calculate Darragh's average speed in miles per hour.

Answer: .... miles per hour [3 marks]

(c) An aircraft takes off from Paris with 120 000 litres of fuel on board. It flies at an average speed of 800 kilometres per hour and uses fuel at a rate of 10 litres per kilometre.

How much fuel is left in the tank when it lands in Mumbai 9 hours later?

Answer: .... l [3 marks]

24. (a)   In a triangle, there are three differently sized angles, A, B and C.
A is the largest angle and C is the smallest angle.
Angle A is 10° more than angle B which is 10° more than C.
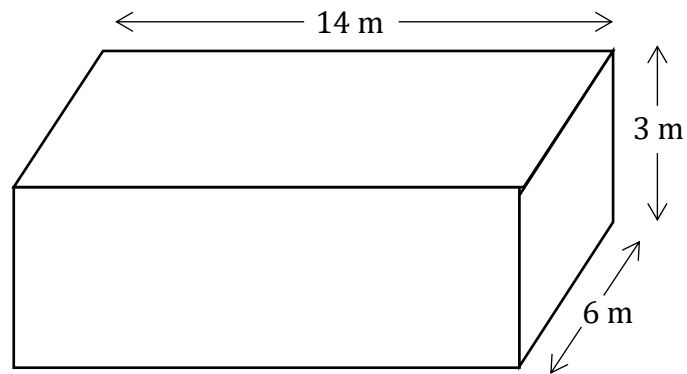What is the size of the angle A?

Answer: .... ° *[2 marks]*

(b)   The angles in a different triangle are in the ratio 1 : 3 : 5. What is the largest angle in the triangle?

Answer: .... ° *[2 marks]*

25. The diagram shows a swimming pool. The swimming pool is in the shape of a cuboid.
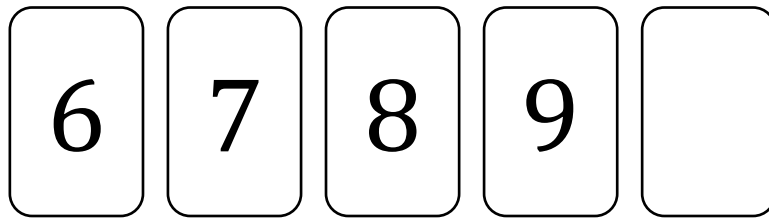

Bisola has to empty the swimming pool so that it can be cleaned.
She is going to pump the water out into containers that hold a maximum of
45 000 litres each.
Given that $1 \text{ m}^3 = 1000$ litres, how many containers does Bisola need to empty a full swimming pool?

Answer: .... containers [3 marks]

26. Below are some cards with some numbers on. 4 are face up and 1 is face down.

$$\boxed{6}\ \boxed{7}\ \boxed{8}\ \boxed{9}\ \boxed{}$$

(a) Find the mean of the four cards that you can see.

Answer: .... [1 mark]

(b) If you turned over the blank card, you would find that the mean is now 10. What number is on the front of the blank card?

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

_____

27. A cable car has just two ticket prices, one for adults and a different one for children. If three adults and five children cost £74 and six adults and two children cost £92 how much is an adult ticket?

Answer: £ .... [3 marks]

28. Points P and Q have coordinates $(1, 4)$ and $(1, -2)$ respectively. For which of the following possible coordinates of point R would triangle PQR **not** be isosceles.

A: $(-5, 4)$
B: $(7, 1)$
C: $(-6, 1)$
D: $(-6, -2)$
E: $(7, -2)$
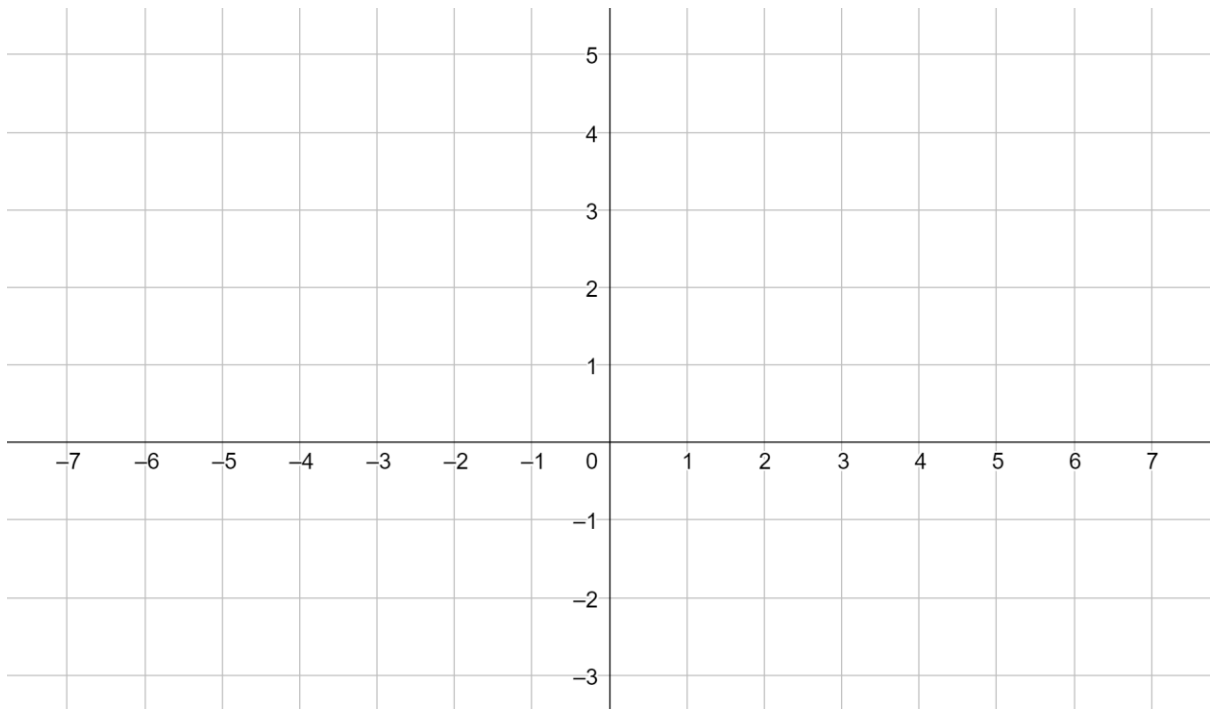
Answer: .... *[1 mark]*

29. There are three numbers x, y and z.

x and y have a mean of 10
x and z have a mean of 12
y and z have a mean of 8

What are the three numbers?

Answer: $x =$ ...., $y =$ ...., $z =$ ....
[3 marks]
_____

30. The operation $\sqrt{}$ means to find the square root of a number.
For example, $\sqrt{64} = 8$, 8 is the square root of 64 because $8 \times 8 = 64$,
and $\sqrt{100} = 10$ since $10 \times 10 = 100$.

The operation ↑ between two numbers is defined as follows:

$$x \uparrow y = \sqrt{\sqrt{x} + \sqrt{y}}$$

For example $36 \uparrow 9 = \sqrt{\sqrt{36} + \sqrt{9}} = \sqrt{6 + 3} = \sqrt{9} = 3$.

Evaluate:
(a) $121 \uparrow 25$

Answer: .... [1 mark]

(b) $25 \uparrow 16 - 4 \uparrow 4$

Answer: .... [2 marks]

(c) $\dfrac{49 \uparrow 81}{64 \uparrow 1}$

Answer: .... [2 marks]

END OF EXAMINATION
NOW CHECK YOUR WORKING