MERCHANT TAYLORS'
School

11+ Specimen Paper

Mathematics

1. From the list of angles below, circle the obtuse angles:

179° 90° 147° 273° 81° 330°

[1 mark]

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2. (a) Look at the shaded column below:

(i) Write down the fraction that is shaded.

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

(ii) Write down an equivalent fraction with a denominator of 100.

Answer: $\frac{\text{.....}}{100}$ *[1 mark]*

(b) Convert the mixed number fraction $6\frac{3}{8}$ into an improper fraction.

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

(c) Solve the fraction calculations below. Give your answer as a mixed number in its simplest form.

(i) $\frac{11}{15} + \frac{17}{30}$

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

(ii) $5 \times \frac{7}{12}$

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

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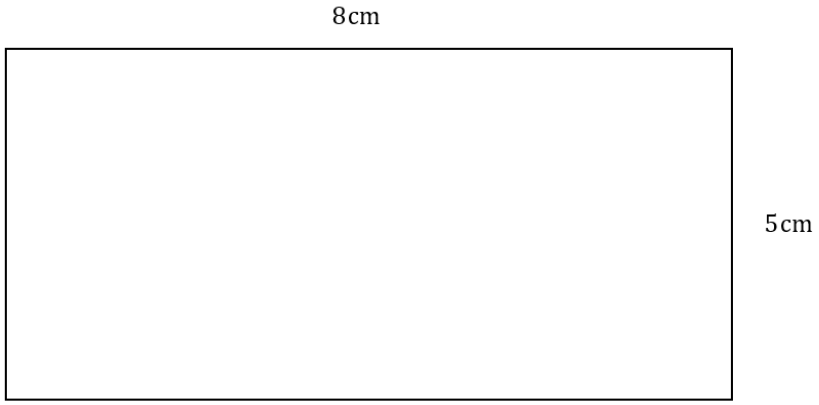
3. Bethany decides to cut the rectangle shown in half diagonally in order to make a triangle.

NOT TO SCALE

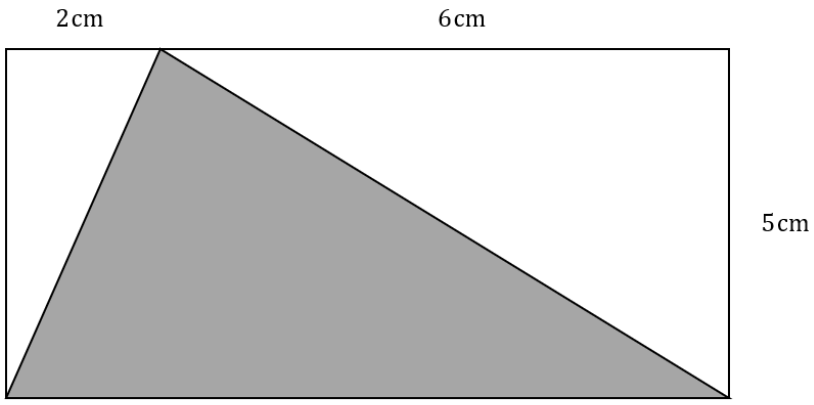


(a) What is the area of the triangle?

Answer: .....cm² [1 mark]

(b) Amit wants to make a different triangle out of the rectangle as shown below:

NOT TO SCALE



Amit says that his triangle has a smaller area than Bethany's.
Is Amit correct? **You must explain your answer**.

Answer: ……

……

……

…… *[1 mark]*

4. Insert one pair of brackets into each of these calculations to make the answer correct.

(a) $2 \times 6^2 - 2 + 5 = 65$

(b) $3 + 5 \times 2^2 = 103$

[2 marks]

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5. (a) Write the following fractions in **ascending** order. Show your method.

$$\frac{5}{3} \quad \frac{5}{9} \quad \frac{7}{18} \quad \frac{5}{6}$$

Answer: ..... [2 marks]

(b) Solve:

$$0.05 + 2\% + \frac{1}{5}$$

Write your final answer as a percentage.

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

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6. (a) The hottest and coldest temperatures for five cities in 2023 are shown in the table below:

City	Hottest Temperature (°C)	Coldest Temperature (°C)
Buenos Aires	39	-6
Marrakesh	42	7
Oslo	26	-18
Paris	34	-4
Tokyo	37	-2

(i) How many times hotter was Marrakesh's hottest temperature than its coldest temperature?

Answer: .....times [1 mark]

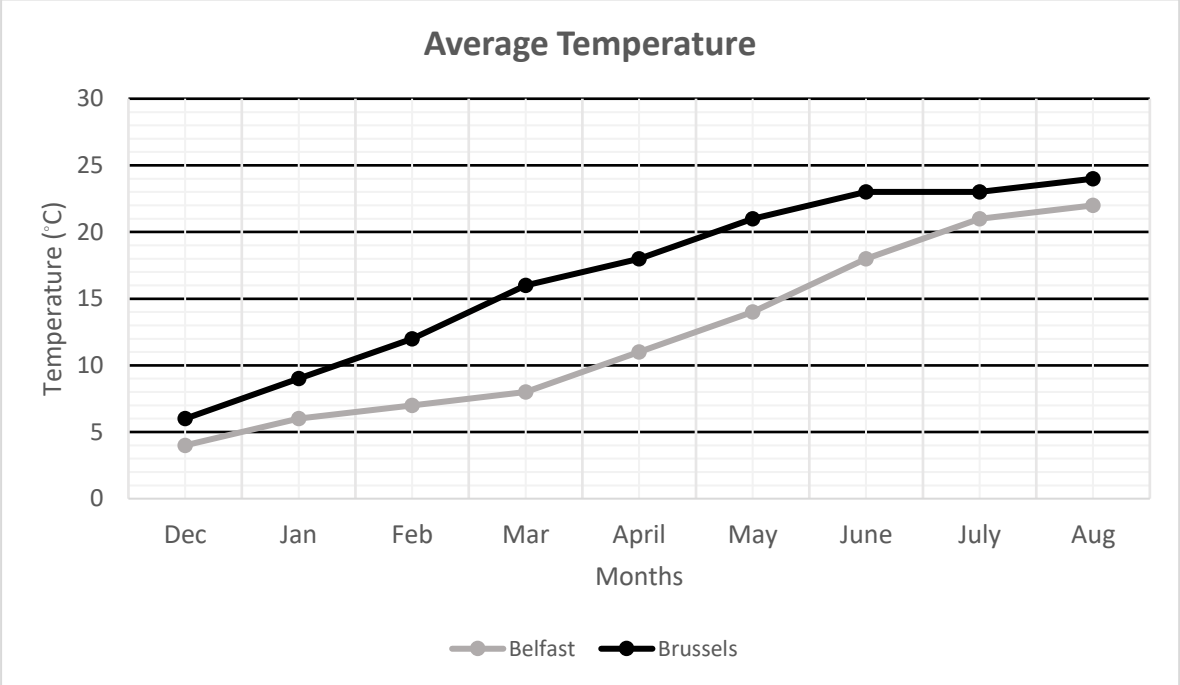
(ii) Which city experienced the largest difference between its hottest and coldest temperatures?

City: ..... [1 mark]

(iii) A sixth city, Riga, was found to have a hottest temperature that was directly half way between Oslo's hottest and coldest temperatures. What was the hottest temperature of this city?

Answer: ..... °C [1 mark]

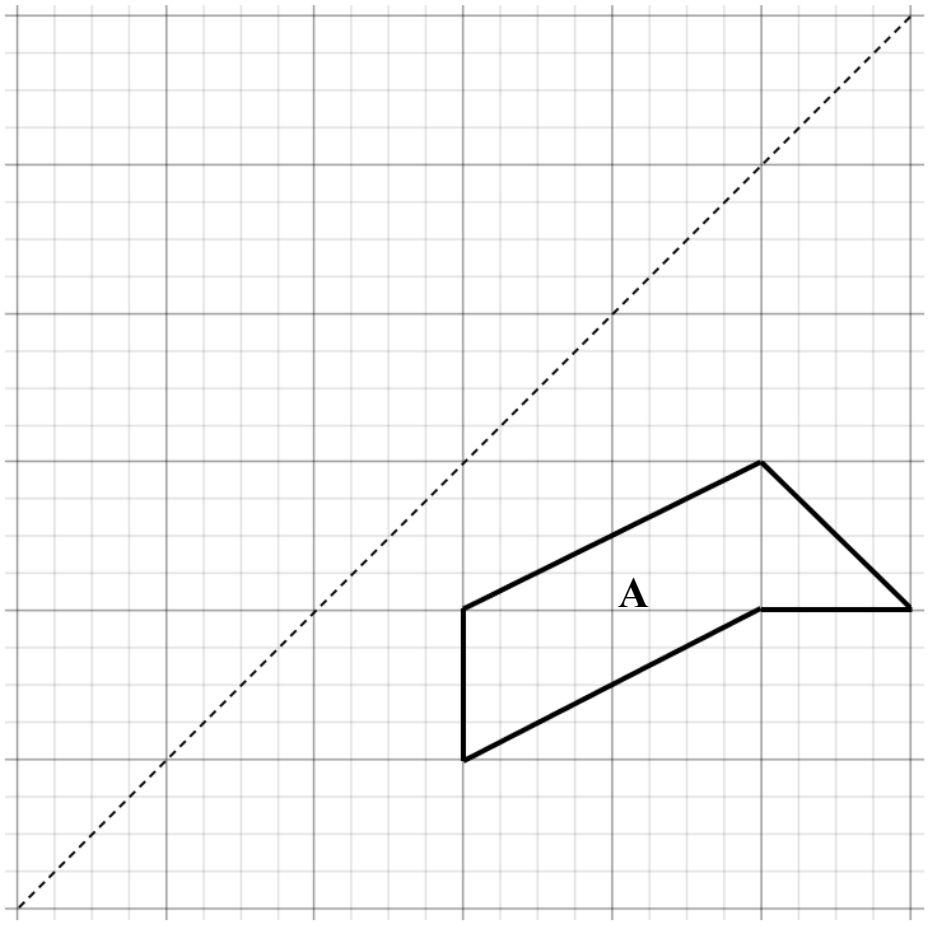
(b) The average temperature of two more cities, Belfast and Brussels, are measured over a period of nine months.



In which month was the average temperature in Brussels twice as big as the temperature in Belfast?

Answer: ..... [1 mark]

7. Reflect shape **A** in the dotted line:



[2 marks]

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8. Here are four number cards.

6	3	5	9

Ben creates two **four-digit** values from the cards. Each one contains **all** four numbers. What is the difference between the **second largest** and **second smallest** value he can create?

Answer: ..... [2 marks]

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9. A letter is chosen at random from a collection of Scrabble tiles that spell the word:

PERIODONTOLOGY

Calculate the probability that the letter chosen is;

a) an **O**

Answer: ..... [1 mark]

b) a **T**

Answer: ..... [1 mark]

c) a vowel

Answer: ..... [1 mark]

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10. There are 60 children on a school trip. They must decide what lunch to have.

30% chose a sandwich.

$\frac{7}{12}$ choose pasta.

The rest all have salad. How many children chose a salad?

Answer: .....children [3 marks]

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11. Zara is sewing 3 dresses in style B using fabric that is 54 inches wide. The table below contains information for determining the yards of fabric needed.

Dress Size		**10**	**12**	**14**	**16**
Style A		Yards of Fabric Needed			
Fabric Width	35 in.	3.25	3.875	3.875	3.875
	45 in.	3	3	3.25	3.25
	54 in.	2.375	2.5	2.75	2.75
	60 in.	2.25	2.25	2.25	2.5
Style B		Yards of Fabric Needed			
Fabric Width	35 in.	3.875	4	4.125	4.625
	45 in.	3.125	3.25	3.25	3.625
	54 in.	2.5	2.875	3	3
	60 in.	2.25	2.375	2.5	2.75

What is the **total** number of yards of fabric required for one dress each of size 10, 12 and 14?

Answer: .....yards [2 marks]

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12. Sarah begins reading a 296 page book on a Monday.
She reads 8 pages every day except on Saturdays when she reads 20 pages.
On what day of the week will she finish reading the book?

Answer: .....[2 marks]

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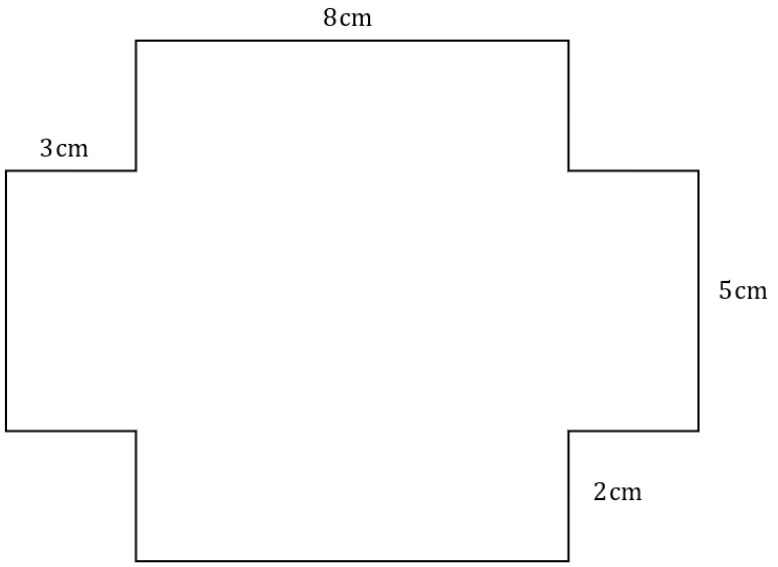
13. The shape below has a vertical and horizontal line of symmetry.



a) Calculate the area of the shape.

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

b) Calculate the perimeter of the shape.

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

c) The shape is cut in half, along the vertical line of symmetry.
Calculate the perimeter of one of the halves of the shape.

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

14. At half-time in a school rugby match, Merchant Sailors had scored all of the points, as usual, in the annual match against Habersprinters' School.
In the second half, each side scored three points and at the end of the match, Merchant Sailors had scored 90% of the points.

What fraction of the points in the match was scored in the second half?
Give your fraction in its simplest form.

Answer: ..... [2 marks]

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15. A school is buying trophies and ribbons for a competition. Each trophy costs £10 and each ribbon costs £6.

a) If the school decides to buy 4 trophies and 8 ribbons, calculate the total cost.

Answer: £..... [1 mark]

b) If the number of ribbons bought is R and the number of trophies bought is T, write a formula for the total cost, C, of the purchase.

Answer: C=…… [1 mark]

c) If the school buys a total of 7 items, and the total cost is £54, how many trophies and how many ribbons did the school buy?

Answer: ..... trophies and..... ribbons [2 marks]

d) If the cost of each trophy increases by £2 and the cost of each ribbon remains the same, how many trophies and ribbons does the school buy if the total budget remains £54 and they still buy a total of 7 items?

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

16. In a quadrilateral with angles A, B, C and D;

- Angle A is half angle B.
- Angle C is $45°$ more than angle A.
- Angle D is $45°$ less than angle B.

Find the value of each of the four angles.

Angle A =…… ° *Angle B* = ……°

Angle C = …… ° *Angle D* = ……°

[3 marks]

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17. A company makes rectangular stamps.
It costs the company 1.2 pence to print a stamp.
The company prints 3000 stamps.
Once it has sold all the stamps, the company has made £684 profit.

a) How much does it sell each stamp for?

Answer: .....p [3 marks]

b) Each stamp is one and a half times taller than it is wide.
If the width of a stamp is 6 cm, how tall is the stamp?

Answer: .....cm [1 mark]

c) The company realises it did not include the cost of paper that the stamps were printed on.
Each piece of paper is square, and has a width of 36 cm.
If the cost of 1 piece of paper is 4 pence, how much money will the company spend on paper if it still makes 3000 stamps?

Answer: £..... [3 marks]

18. The number of goals scored in a series of football matches were as follows:

Number of goals	1	2	3
Number of matches	8	8	x

a) If the modal number of goals is 3, what is the smallest possible value of x?

Answer: ..... [1 mark]

b) If the median number of goals is 2, what is the largest possible value of x?

Answer: ..... [2 marks]

c) If the mean number of goals is 2.5, find x.

Answer: ..... [3 marks]

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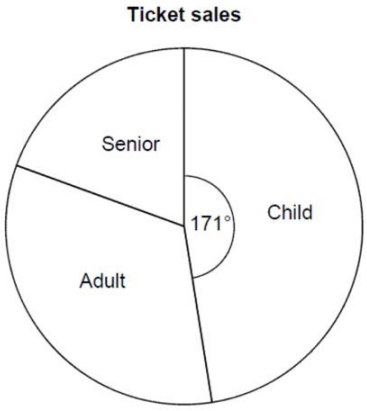
19. The pie chart shows information about the sales of 800 Travis Drake tickets.
There were twice as many adult ticket sales as senior ticket sales.



How many senior tickets sales were sold?

Answer: .....tickets [3 marks]

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20. Two numbers share the following properties:

- They are both factors of 288 and 360.
- They are both multiples of 4 and 6.
- They are both larger than 25.

What are these two numbers?

Answer: ..... and ..... [4 marks]

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21. You are tasked with organising a set of coloured pens and notebooks for a class activity. You are given:

- 3 types of pens: red (r), blue (b), and green (g).
- 2 types of notebooks: lined (l) and squared (s).

a) In the space below list all possible combinations of choosing one pen and one notebook.

[1 mark]

b) If you chose 2 pens and 1 notebook at random without replacement, how many different ways can you make this selection?
You may assume that order of selection does not matter.

Answer: ..... [2 marks]

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22. If all the whole numbers from 1 to 1000 inclusive are written down, how many times will the digit "0" be written?

Answer: ..... [2 mark]

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23. A robot, which is facing East, is programmed to:

- travel 5m then turn through 10° clockwise.
- travel a further 5m then turn through 20° clockwise.
- travel a further 5m then turn through 30° clockwise, and so on.

Each move consists of moving 5m in a straight line and then turning clockwise through an angle which increases by 10° after each move.
How far has it travelled by the time it is first facing South at the end of a move?

Answer: .....metres [2 marks]

END OF EXAMINATION
NOW CHECK YOUR WORKING