

# Friday 24th March 2023

Please write clearly, in block capitals.

Centre number

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Surname

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Forename(s)

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Candidate signature

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## AM Session

# GCSE MATHEMATICS

# F

Foundation Tier      Paper 2 Calculator

Time allowed: 1 hour 30 minutes

### Materials

For this paper you must have:

- mathematical instruments
- a calculator.



### Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

### Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

For Examiner's Use	
Pages	Mark
2 - 3	
4 - 5	
6 - 7	
8 - 9	
10 - 11	
12 - 13	
14 - 15	
16 - 17	
18 - 19	
20 - 21	
22	
<b>TOTAL</b>	

### Advice

- In all calculations, show clearly how you work out your answer.

- 1 Work out the value of 10% of 50 [1 mark]

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Answer \_\_\_\_\_

- 2 Work out the value of  $3^2$  [1 mark]

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Answer \_\_\_\_\_

- 3 Write down the probability of rolling a 5 on an ordinary fair dice.  
Give your answer as a fraction. [1 mark]

Answer \_\_\_\_\_

- 4 12 pens cost £2.40  
How much do 30 pens cost? [3 marks]

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Answer £ \_\_\_\_\_

5 Solve  $4x + 1 = 39$

[2 marks]

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$x =$  \_\_\_\_\_

6 Here is a list of numbers

7      4      9      10      4      3      5      8

6 (a) Write down the mode.

[1 mark]

Answer \_\_\_\_\_

6 (b) Work out the mean.

[2 marks]

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Answer \_\_\_\_\_

- 7 Sam spends exactly £40 on petrol.  
The petrol costs £1.75 per litre.  
Work out the number of litres of petrol she buys.  
Give your answer to 1 decimal place.

[3 marks]

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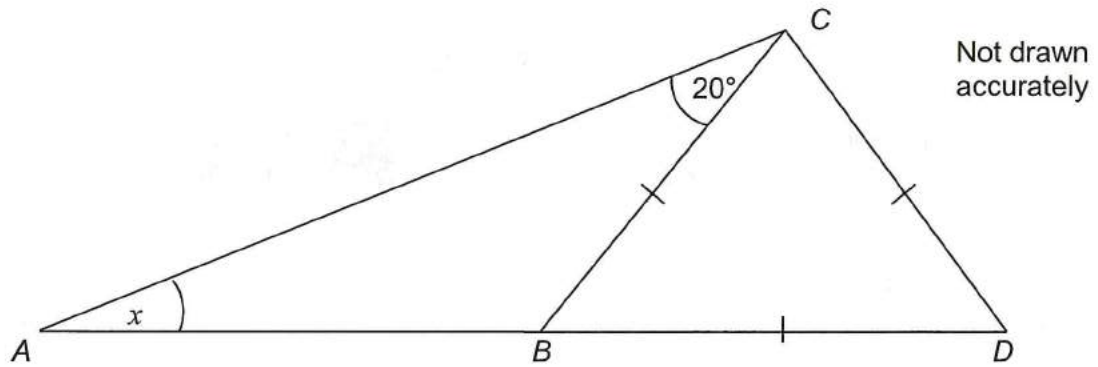
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Answer \_\_\_\_\_ litres

8

The diagram shows a triangle  $ACD$  and an **equilateral** triangle  $BCD$



Work out the size of angle  $x$

[3 marks]

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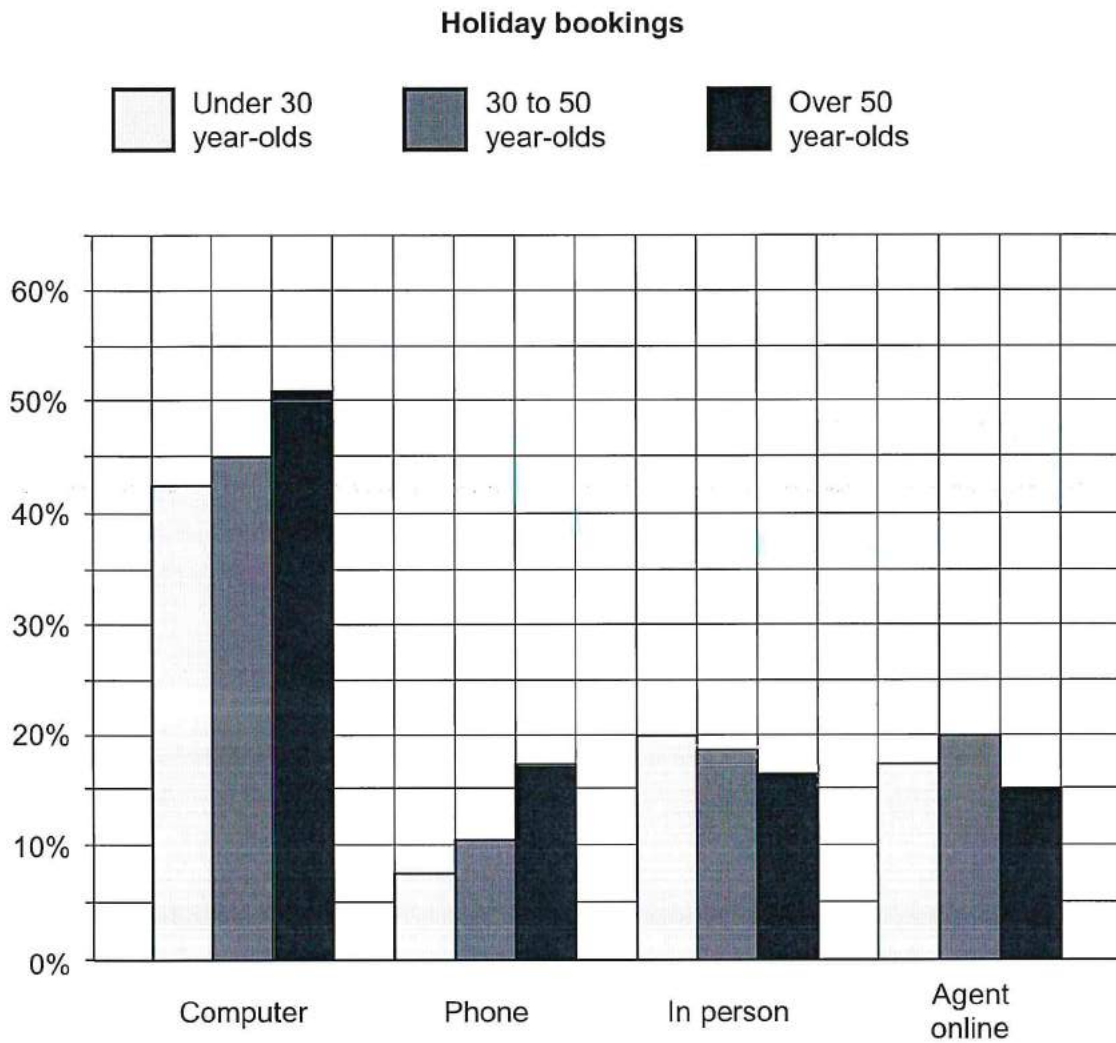
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Answer \_\_\_\_\_

Turn over for the next question

Turn over ▶

- 9 The bar chart shows information about how holiday bookings are made.



- 9 (a) Which **two** ways of booking are most popular for under 30 year-olds?

[2 marks]

Answer \_\_\_\_\_ and \_\_\_\_\_

- 9 (b) In total, what percentage of 30 to 50 year-olds booked in person or with an agent online?  
Give your answer to the nearest 10%

[2 marks]

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Answer \_\_\_\_\_ %

- 9 (c) Make **two** comparisons of the data for 30 to 50 year-olds with 50 year-olds and over.

[2 marks]

Comparison 1 \_\_\_\_\_

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Comparison 2 \_\_\_\_\_

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Turn over for the next question



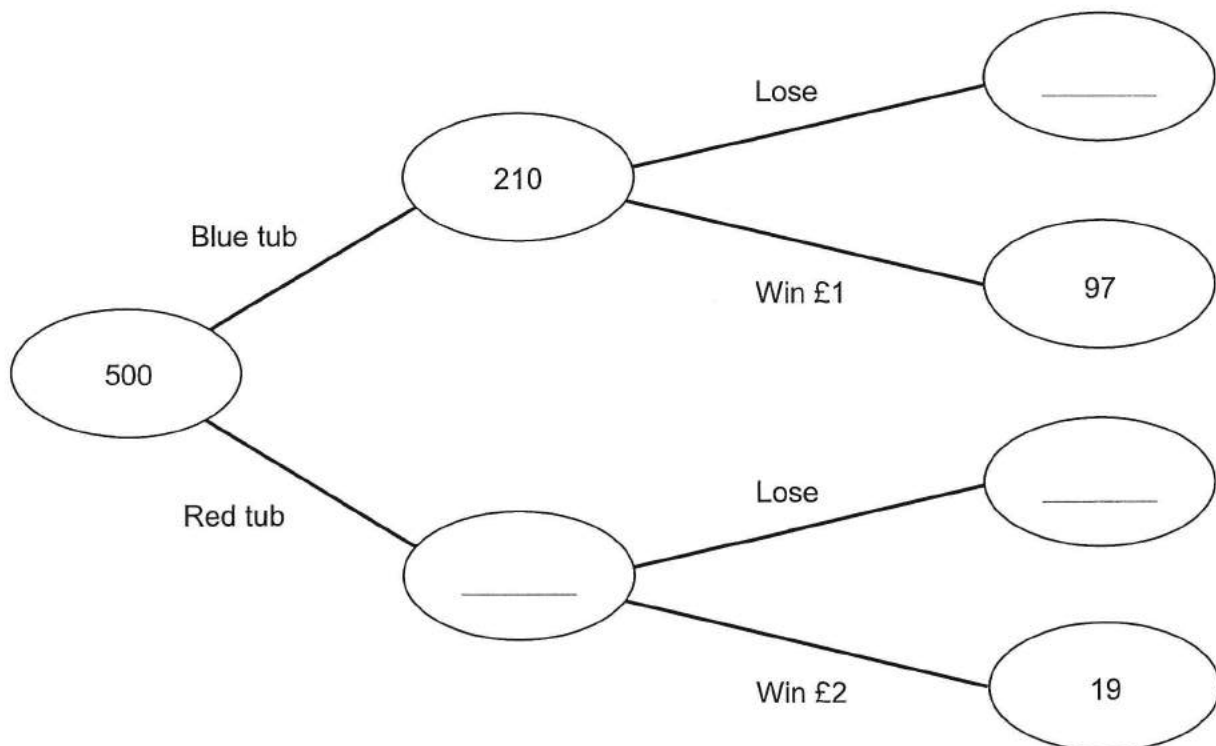
10

Here is a game at a school fair.

**Blue tub****Red tub**

500 people play the game at the fair.

The frequency tree shows some of the outcomes.



10 (a) Complete the frequency tree.

**[2 marks]**



- 10 (b)** A player has one go at the game.  
Use the frequency tree to estimate the probability that the player wins some money.

[2 marks]

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Answer \_\_\_\_\_

- 11** There are between 20 and 30 students in a class.  
The ratio of left-handed students to right-handed students is 3 : 8  
How many students are in the class?

[2 marks]

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Answer \_\_\_\_\_

**Turn over for the next question**

- 12** A cake shop makes 120 cakes and 720 doughnuts each day.  
Each person works for 8 hours a day and makes either cakes or doughnuts.  
In 1 hour a person can make 3 cakes or 30 doughnuts.

- 12 (a)** Work out the minimum number of people needed each day.

**[4 marks]**

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Answer \_\_\_\_\_

12 (b)

The cake shop makes some changes.

In 1 hour each person now makes 1 more cake **or** 20% more doughnuts.

Cakes are sold for £4.80

Doughnuts are sold for 25p

The manager does these calculations.

**Making cakes for 1 hour**

$$1 \text{ more cake} = 3 + 1 = 4 \text{ cakes}$$

$$\text{Sales of cakes} = 4 \times \text{£}4.80 = \text{£}18.50$$

**Making doughnuts for 1 hour**

$$20\% \text{ more doughnuts} = 30 + 20 = 50 \text{ doughnuts}$$

$$\text{Sales of doughnuts} = 50 \times 25 = \text{£}125$$

$$\text{Total from sales} = \text{£}18.50 + \text{£}125 = \text{£}143.50$$

Check his working, correct any mistakes and write out the correct calculations below.

[4 marks]

**Making cakes for 1 hour**

$$1 \text{ more cake} = \underline{\hspace{4cm}}$$

$$\text{Sales of cakes} = \underline{\hspace{4cm}}$$

**Making doughnuts for 1 hour**

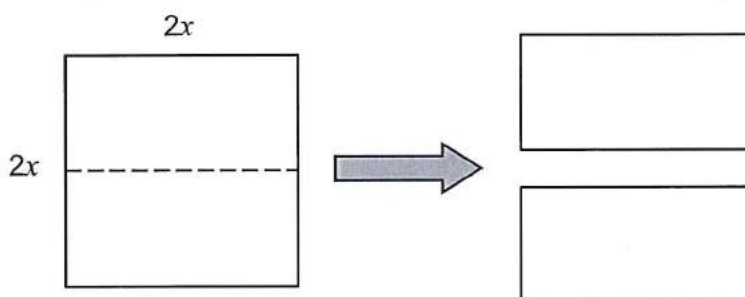
$$20\% \text{ more doughnuts} = \underline{\hspace{4cm}}$$

$$\text{Sales of doughnuts} = \underline{\hspace{4cm}}$$

$$\text{Total from sales} = \underline{\hspace{4cm}}$$

Turn over ▶

- 13 A square with sides  $2x$  is cut into two equal rectangles as shown.



- 13 (a) Tick a box to show whether each statement is true or false.

[3 marks]

	True	False
area of one rectangle = $x^2$	<input type="checkbox"/>	<input type="checkbox"/>
perimeter of one rectangle = $6x$	<input type="checkbox"/>	<input type="checkbox"/>
area of square = $2 \times$ area of one rectangle	<input type="checkbox"/>	<input type="checkbox"/>
diagonal of the square = $2x$	<input type="checkbox"/>	<input type="checkbox"/>

- 13 (b) The perimeter of each rectangle is 27 cm

Work out the area of the square.

[3 marks]

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Answer \_\_\_\_\_  $\text{cm}^2$

- 14** This formula works out the tax you pay on what you earn.

$$T = 0.2(E - 12570)$$

$T$  is the tax you pay in pounds.

$E$  is the amount you earn in pounds.

- 14 (a)** How much tax do you pay if you earn £24 000?

**[2 marks]**

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Answer £ \_\_\_\_\_

- 14 (b)** What is the most you can earn without paying tax?

**[1 mark]**

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Answer £ \_\_\_\_\_

- 14 (c)** Alison pays £6300 tax.

Work out the amount she earns.

**[3 marks]**

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Answer £ \_\_\_\_\_

15 (a) Solve the inequality  $\frac{2x}{3} \leq 4$

[2 marks]

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Answer \_\_\_\_\_

15 (b) Solve the inequality  $4(x + 1) > 12$

[2 marks]

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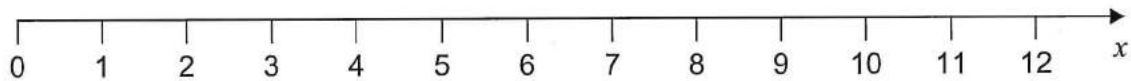
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Answer \_\_\_\_\_

15 (c) Represent the solution set that satisfies **both** answers to part (a) and (b) on the number line.

[1 mark]



Do not write  
outside the  
box

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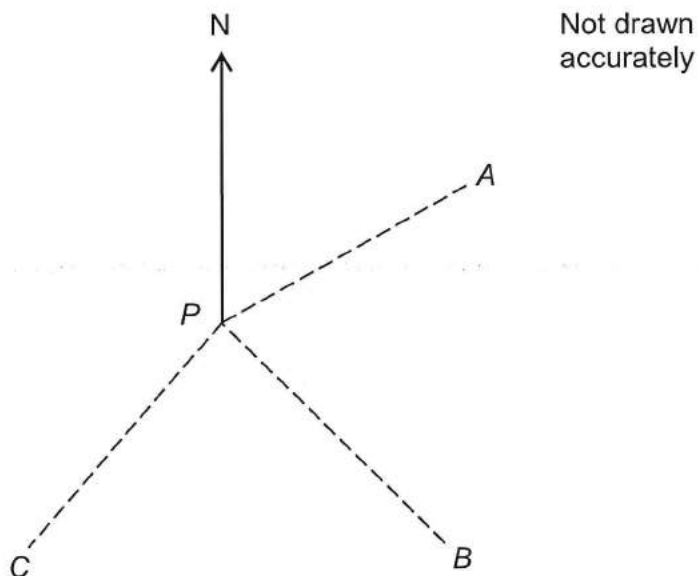
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ANSWER IN THE SPACES PROVIDED**

      
**5**

**Turn over ▶**



- 16 Amy (A), Ben (B) and Clare (C) start jogging from  $P$  at the same time.  
They all jog at 10 km per hour  
Amy jogs on a bearing of  $055^\circ$   
Ben jogs on a bearing of  $150^\circ$   
Clare jogs on a bearing of  $240^\circ$



- 16 (a) How long does it take Ben to jog 5 kilometres?  
Give your answer in minutes.

[1 mark]

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Answer \_\_\_\_\_ minutes

16 (b) Clare says,

“After 1 hour Amy and Ben will have jogged 10 kilometres each,  
10 miles + 10 miles equals 20 miles, so they are 20 miles apart.”

Is she correct?

Tick a box.

Yes

No

Give a reason for your answer.

[2 marks]

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16 (c) Who is closer to Ben after 1 hour?

Tick a box.

Amy

Clare

You **must** show your working.

[2 marks]

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- 17 1 mile = 5280 feet  
1 foot = 12 inches  
1 inch = 2.54 cm

Use the given conversions to show that 1 mile is approximately 1600 metres.

[3 marks]

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- 18 Tins of baked beans are sold in different pack sizes.



1 tin for £1.20



1 pack of 4 for £3.50  
or  
2 packs of 4 for £6.50



1 pack of 6 for £5

What is the cheapest way to buy 24 cans of baked beans?

You **must** show your working.

[4 marks]

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Answer \_\_\_\_\_

19 Volume of a sphere =  $\frac{4}{3}\pi r^3$  where  $r$  is the radius.

19 (a) Work out the volume of a sphere of radius 6 cm.

[2 marks]

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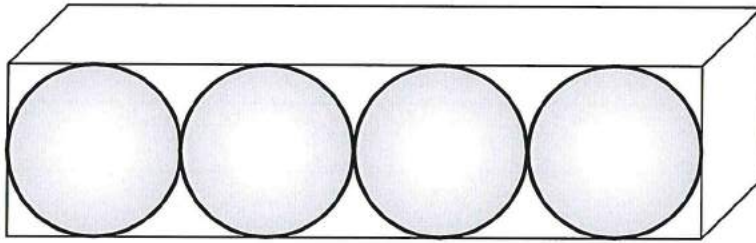
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Answer \_\_\_\_\_ cm<sup>3</sup>

19 (b) Four spheres of radius 6 cm are packed tightly into a cuboid as shown.



Work out the volume of the cuboid.

[4 marks]

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Answer \_\_\_\_\_ cm<sup>3</sup>

20

Here are two piles of the same type of paper.

Each sheet of paper weighs 5 g.

The taller pile weighs 7.5 kg.



height of taller pile : height of shorter pile = 5 : 3

Work out the number of sheets of paper in the shorter pile.

[3 marks]

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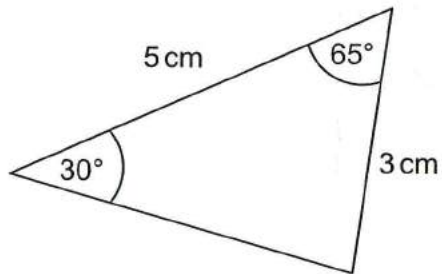
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Answer \_\_\_\_\_

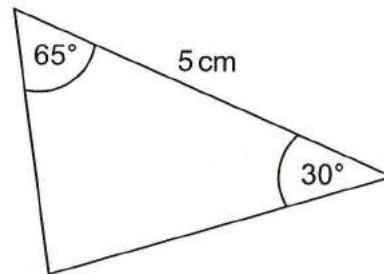
21

Here are four triangles.

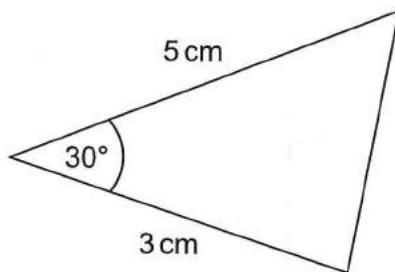
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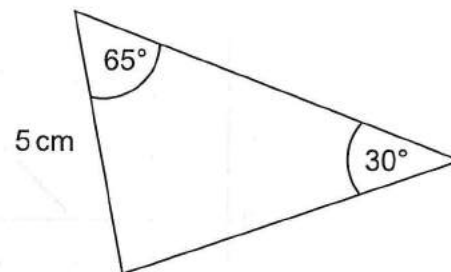
K



L



M

Which **two** triangles are congruent?

Give a reason for your answer.

[2 marks]

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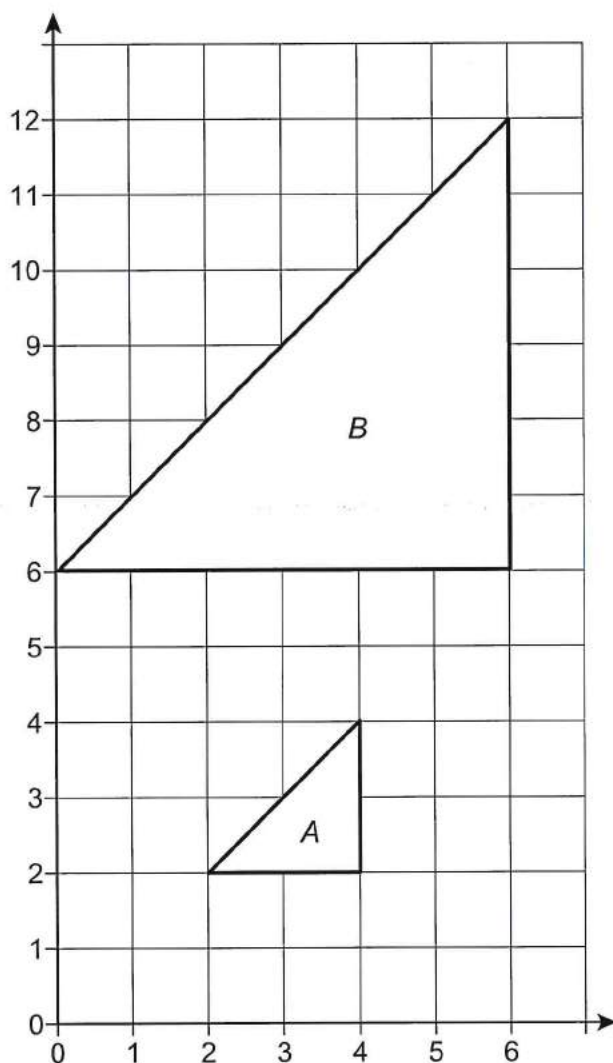


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22

Describe fully the single transformation that maps triangle *A* to triangle *B*.

[3 marks]




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**END OF QUESTIONS**

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