

Surname	Centre Number	Candidate Number
First name(s)		0



GCSE

C300U10-1



WEDNESDAY, 6 NOVEMBER 2024 – MORNING

MATHEMATICS – Component 1
Non-Calculator Mathematics
FOUNDATION TIER

2 hours 15 minutes

ADDITIONAL MATERIALS

An additional formulae sheet.
The use of a calculator is not permitted in this examination.
A ruler, protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.
Do not use gel pen or correction fluid.
You may use a pencil for graphs and diagrams only.
Write your name, centre number and candidate number in the spaces at the top of this page.
Answer **all** questions.
Write your answers in the spaces provided in this booklet.
If you run out of space, use the additional page(s) at the back of the booklet, taking care to number the question(s) correctly.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.
Unless stated, diagrams are not drawn to scale.
Scale drawing solutions will not be acceptable where you are asked to calculate.
The number of marks is given in brackets at the end of each question or part-question.
You are reminded of the need for good English and orderly, clear presentation in your answers.

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	5	
2.	3	
3.	3	
4.	2	
5.	4	
6.	4	
7.	5	
8.	4	
9.	7	
10.	6	
11.	6	
12.	5	
13.	2	
14.	6	
15.	3	
16.	5	
17.	5	
18.	4	
19.	6	
20.	7	
21.	3	
22.	6	
23.	6	
24.	7	
25.	6	
Total	120	



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Formula list

Area and volume formulae

Where r is the radius of the sphere or cone, l is the slant height of a cone and h is the perpendicular height of a cone:

$$\text{Curved surface area of a cone} = \pi r l$$

$$\text{Surface area of a sphere} = 4\pi r^2$$

$$\text{Volume of a sphere} = \frac{4}{3}\pi r^3$$

$$\text{Volume of a cone} = \frac{1}{3}\pi r^2 h$$

Kinematics formulae

Where a is constant acceleration, u is initial velocity, v is final velocity, s is displacement from the position when $t = 0$ and t is time taken:

$$v = u + at$$

$$s = ut + \frac{1}{2}at^2$$

$$v^2 = u^2 + 2as$$



1. (a) What number must be added to 268 to make 415?

[1]

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- (b) Work out 16×6 .

[1]

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- (c) Work out $\frac{0.5 \times 30}{6}$.

[2]

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- (d) Work out $5 \times 3 + 4 \div 2$.

[1]

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2. One day Phoebe recorded the number of hours of sunshine in some cities in England. The pictogram below shows some of her results.

London			
Newcastle			
Birmingham			
Liverpool			
Southampton			

Key:  represents hours

- (a) There were 10 hours of sunshine in London.
Complete the key for the pictogram.

[1]

- (b) How many more hours of sunshine did Liverpool have than Newcastle?

[1]

- (c) There were 7 hours of sunshine in Southampton.
Complete the pictogram.

[1]



3. Complete the table below so that each row shows a decimal and its equivalent simplified fraction.

The first row has been completed for you.

[3]

Decimal	Fraction
0.5	$\frac{1}{2}$
	$\frac{7}{10}$
0.25	
0.03	
	$\frac{11}{50}$

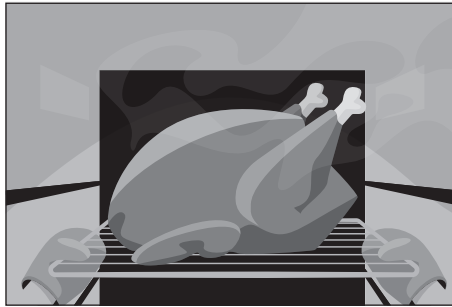
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4.



The recommended time taken to cook a turkey is given by the following formula.

$$\text{Time} = 20 \text{ minutes per kilogram} + 90 \text{ minutes}$$

Calculate the time taken to cook an 8 kg turkey.

[2]

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Time taken = ... minutes

5. (a) Write $\frac{8}{32}$ as a fraction in its simplest form.

[1]

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- (b) Write $\frac{7}{25}$ as a percentage.

[1]

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- (c) Find $\frac{2}{9}$ of 45.

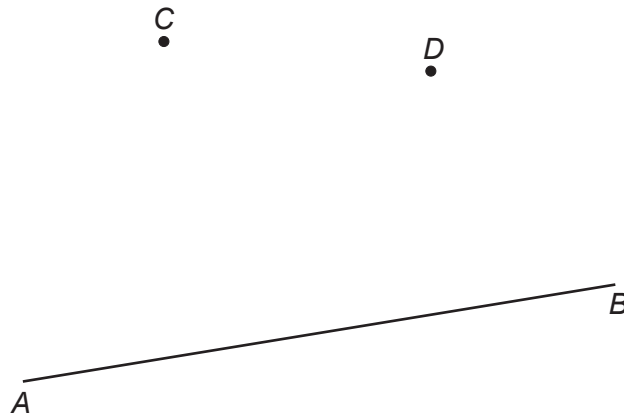
[2]

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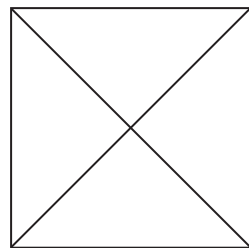
6. (a)



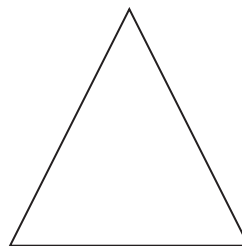
(i) Draw a line parallel to AB , through the point C . [1]

(ii) Draw a line perpendicular to AB , through the point D . [1]

(b) The plan and front elevation of a 3D shape are shown below.



Plan



Front

Circle the correct name for the 3D shape. [1]

cuboid

square-based
pyramid

cone

triangle-based
pyramidtriangular
prism

(c) Nicola thinks that an angle of 190° is an obtuse angle.
Explain why Nicola is incorrect. [1]

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7. Here is part of a train timetable.

Ashby	08:19
Brilfax	08:25
Chemery	08:42
Drago	09:08
Elderville	09:17

(a) How many minutes should the train journey from Brilfax to Drago take?

[2]

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(b) Carley lives in Ashby.
She works Monday to Friday in an office in Elderville.
Every morning she catches the 08:19 train from Ashby.

Last week the train left Ashby on time each morning.
The train was late arriving at Elderville on Monday but arrived on time on the other four days.
For the week, the total train journey time to work was 5 hours and 6 minutes.

How many minutes late was the train when it arrived at Elderville on Monday?

[3]

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The train was minutes late on Monday



8. Lewis buys the following items:

- 3 bottles of milk costing £1.50 each
- 1 loaf of bread costing £1.40
- 2 blocks of butter.

Lewis pays with a £10 note and is given 60p change.
How much does each block of butter cost?
You must show all your working.

[4]

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Each block of butter costs



9. Adrian works in a factory.
His normal rate of pay is £14 per hour.

Adrian usually works 22 hours per week and overtime if needed.

Any overtime hours are paid at a rate of $1\frac{1}{2}$ times his normal rate of pay.

- (a) One week Adrian worked for 28 hours.
Calculate Adrian's pay for this week.

[4]

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- (b) The following week, Adrian's normal rate of pay increased.
He worked for 22 hours and was paid £330.

Show that Adrian's rate of pay increased by less than 10%.

[3]

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10. (a) Solve $6x - 3 = 27$.

[2]

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(b) Simplify $2w \times 2w \times 3w$.

[2]

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- (c) (i) One day Nick spent k minutes on his mobile phone.
Ellie spent 10 minutes less than Nick on her mobile phone.

Write an expression, in terms of k , for the number of minutes that Ellie spent on her mobile phone.

[1]

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- (ii) A dress costs t pounds.
Write an expression, in terms of t , for the cost of the dress in pence.

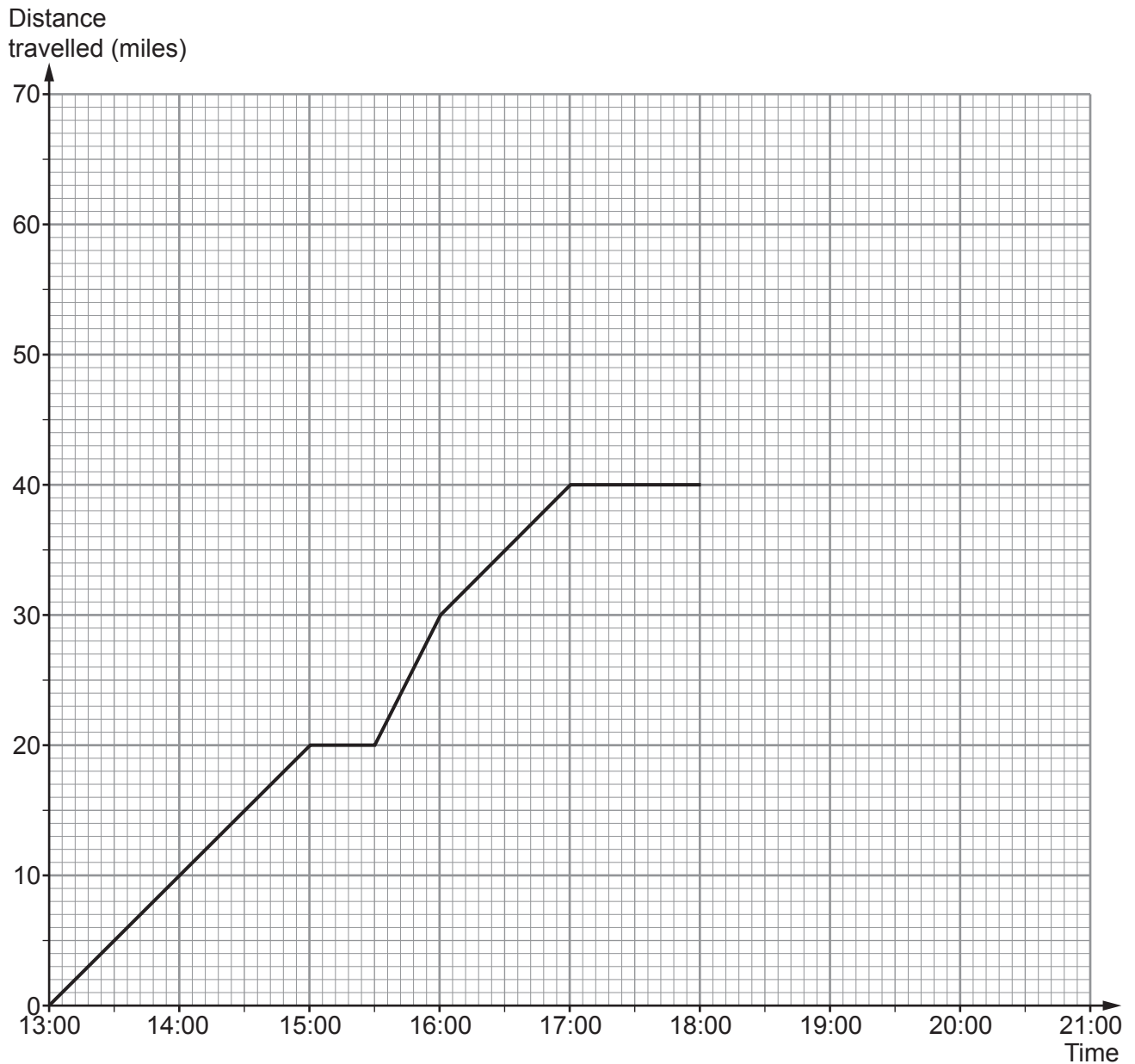
[1]

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11. Oliver went for a ride on his bike.
Some of his journey is represented on the distance-time graph below.



- (a) What was Oliver's average speed between 13:00 and 15:00?

[2]

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Oliver's average speed = ... mph



- (b) Give an explanation for the shape of the graph between 17:00 and 18:00. [1]

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- (c) Between which two times was Oliver cycling at the greatest speed? [1]

..... and

- (d) Oliver started the final part of his cycle ride at 18:00.
He cycled 20 miles at an average speed of 8 mph.
Draw this part of the cycle ride on the distance-time graph. [2]

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12. (a) Teddy has to work out $\sqrt{400}$.
His answer is 200.

Is Teddy's answer correct?

Yes

☐

No

☐

Explain why.

[1]

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- (b) Calculate $5^3 + 5^2$.

[2]

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- (c) Write down the number that is both a factor of 16 and a prime number.

[1]

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- (d) Given that $78 \times 132 = 10\,296$, write down the answer to $10\,296 \div 780$.

[1]

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13.



Ledina goes to Brown Abbey School.
It is a secondary school with 1500 pupils.

Ledina wants to carry out a survey to find out pupils' views of the school uniform.
She plans to ask 10 pupils in Year 7.

Give **two** criticisms of Ledina's plan.

[2]

1.

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2.

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14. Harry is a football player.

(a) Each training session, he spends:

- 18% of the time practising shooting
- $\frac{3}{20}$ of the time practising tackling
- the rest of the time practising passing.



What percentage of each training session does Harry spend practising passing? [3]

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- (b) Harry borrows £80 to pay for a new pair of football boots.
Simple interest is charged at 5% per month on the money he borrowed.

Harry does not make any repayments.
After how many months will he owe £120?

[3]

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15. The points Y and Z are shown on the scale drawing below.

Point X is 200 m from point Y on a bearing of 150° .

Plot point X on the scale drawing below.

Give the bearing of point X from point Z.

[3]

Scale:
1 cm represents 25 m



Bearing of X from Z = ... $^\circ$



16.



- (a) There are between 30 and 40 marbles in a bag.
Amy and Beatrice share the marbles in the ratio 1 : 8.
There are no marbles left in the bag.

How many marbles does Amy have?

[2]

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Amy has marbles

- (b) Chloe and Davina have a different bag of marbles.
They share their marbles in the ratio 3 : 5.
Davina gets 30 more marbles than Chloe.

How many marbles do they each get?

[3]

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Chloe gets marbles

Davina gets marbles



17. Kristoff is a baker.
He is baking bread.
The flour that he needs is sold in bags of two different sizes:
- Large bags contain 2.5 kg.
 - Small bags contain 1.5 kg.



2.5 kg costs £1.10.



1.5 kg costs £0.80.

Diagram not drawn to scale

30 of the large bags contain **exactly** the quantity of flour that Kristoff needs.
The local supplier only has the small bags in stock.

Kristoff buys exactly the quantity of flour he needs in small bags.
How much more will he pay than if he bought the same quantity in large bags?
You must show all your working.

[5]

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Kristoff will pay more.



18. In the diagram below, ABC is an isosceles triangle and DA is a straight line.

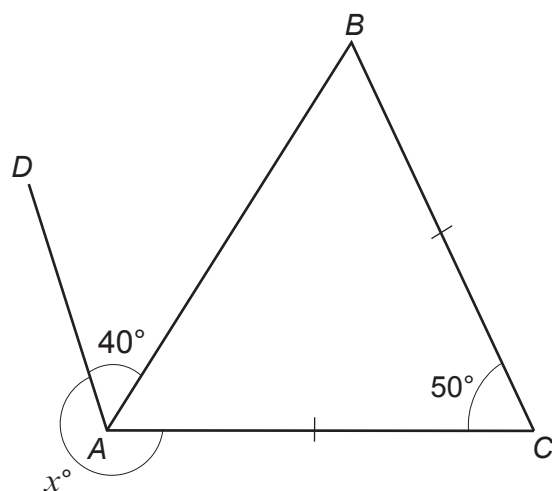


Diagram not drawn to scale

Show that $x = 255$.

You must give a reason for each step of your answer.

[4]

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19. A bag contains some coloured counters.
Some are red, some are yellow, some are orange and the rest are green.

One counter is selected at random from the bag.

The probability of selecting:

- a yellow counter is twice the probability of selecting an orange counter
- a green counter is three times the probability of selecting a yellow counter.

- (a) Write down the ratio of the number of yellow counters to the number of orange counters to the number of green counters. [2]

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yellow counters : orange counters : green counters = ... : :

- (b) The probability of selecting a red counter is 0.46.

What is the probability of selecting a green counter?
You must show all your working. [4]

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Probability of selecting a green counter = ...



20. (a) Expand and simplify $3(5a-2)-7(a-4)$.

[2]

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- (b) Show that the triangle below is **not** isosceles.
You must use an algebraic method and not trial and improvement.

[5]

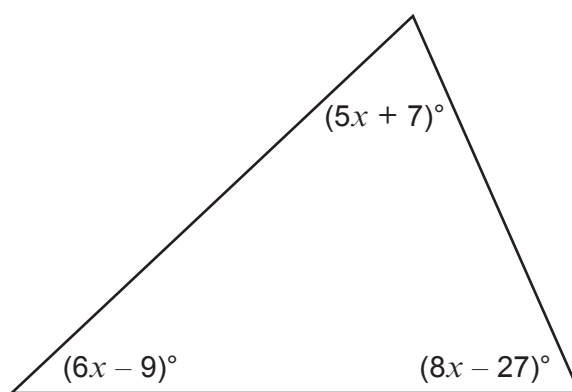


Diagram not drawn to scale

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21. $\mathbf{p} = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$, $\mathbf{q} = \begin{pmatrix} -1 \\ 2 \end{pmatrix}$

Find the values of m and n such that $m(\mathbf{p} + \mathbf{q}) = \begin{pmatrix} 5 \\ n \end{pmatrix}$.

[3]

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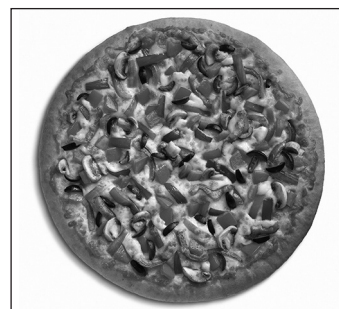
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$$m = \dots\dots\dots n = \dots\dots\dots$$



22. Jim works in the office for a pizza delivery company. Last night he recorded the times for the first 50 deliveries. These times are recorded in the table below.



Delivery time (t mins)	Number of deliveries
$0 < t \leq 10$	10
$10 < t \leq 20$	12
$20 < t \leq 30$	16
$30 < t \leq 40$	12

- (a) Calculate an estimate of the mean time for these 50 deliveries.

[4]

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- (b) Calculate an estimate of the percentage of these deliveries that took 25 minutes or more.

[2]

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23. (a) Simplify the following ratio,

[2]

$$15\text{ cm}^2 : 300\text{ mm}^2$$

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- (b) Sura is making a cake. The main ingredients are flour, sugar and dried fruit. She uses these ingredients with their masses in the ratio 5 : 3 : 7.

- (i) What fraction of the main ingredients is the mass of the dried fruit?

[1]

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- (ii) The combined mass of the flour and sugar is 560 g.
What is the mass of the dried fruit?

[3]

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24. Hannah and Imran often play badminton and tennis matches against each other.

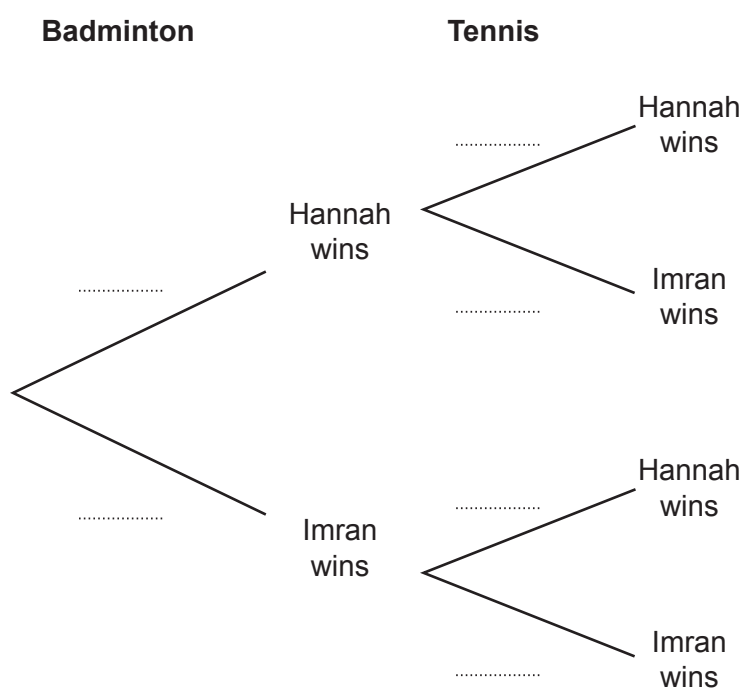
The probability that Hannah wins a badminton match is $\frac{9}{10}$.

The probability that Hannah wins both a badminton match **and** a tennis match is $\frac{9}{50}$.

One Saturday, Hannah and Imran play one badminton match and one tennis match.
The outcomes of the matches are independent.

(a) Complete the tree diagram below.

[4]



(b) Calculate the probability that Hannah wins exactly one match.

[3]

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25. (a) Four triangles are shown in the diagram below.

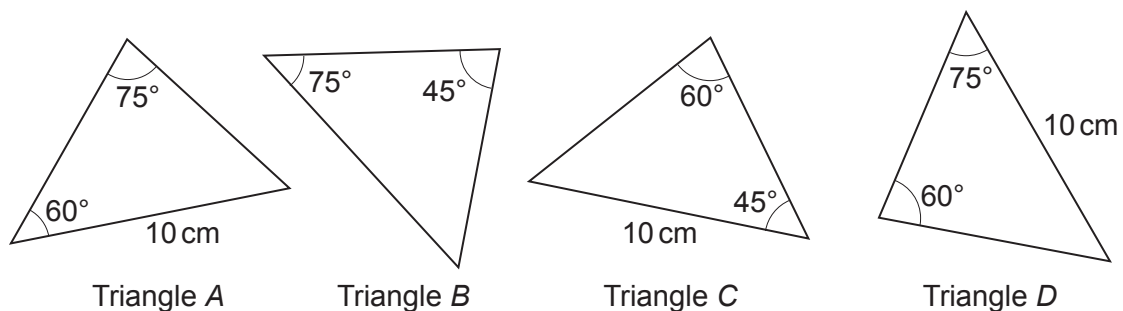


Diagram not drawn to scale

For each of the following statements choose 'True', 'False' or 'Need more information'.
Tick **one** box for each statement.

[2]

Statement	True	False	Need more information
Triangle A is congruent to Triangle B			
Triangle C is congruent to Triangle D			
Triangle A is congruent to Triangle C			



- (b) Is it possible to draw an isosceles triangle with an exterior angle of 60° ?
Tick the appropriate box and show working to explain your reason.

[2]

Yes ☐ No ☐

Reason:

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- (c) Two triangles are shown in the diagram below.

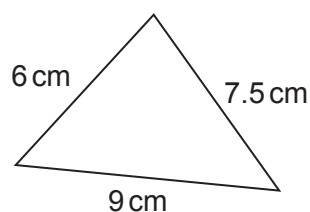
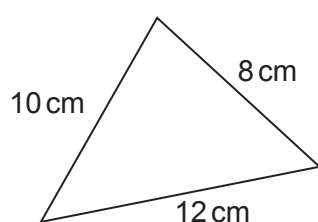


Diagram not drawn to scale

Show that the two triangles are mathematically similar.

[2]

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