Surname	Centre Number	Candidate Number
First name(s)		0

GCSE

3300U40-1

S24-3300U40-1

WEDNESDAY, 12 JUNE 2024 – MORNING

MATHEMATICS
UNIT 2: CALCULATOR-ALLOWED
INTERMEDIATE TIER

1 hour 45 minutes

ADDITIONAL MATERIALS

A calculator will be required for 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** the questions in the spaces provided.

If you run out of space, use the additional page at the back of the booklet. Question numbers must be given for all work written on the additional page.

Take π as 3·14 or use the π button on your calculator.

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.

In question **8**, the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**3**	
2.	**3**	
3.	**4**	
4.	**6**	
5.	**5**	
6.	**4**	
7.	**3**	
8.	**5**	
9.	**3**	
10.	**3**	
11.	**4**	
12.	**4**	
13.	**5**	
14.	**6**	
15.	**2**	
16.	**6**	
17.	**3**	
18.	**3**	
19.	**4**	
20.	**4**	
Total	**80**	

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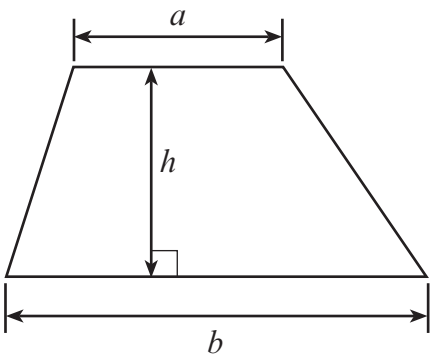
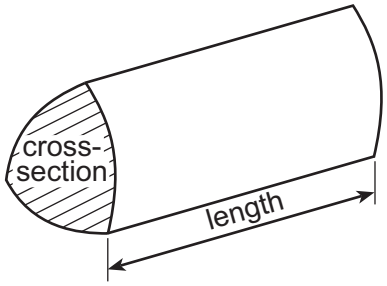
Formula List – Intermediate Tier

Area of trapezium $= \frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length



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1. Solve each of the following equations.

(a) $\frac{x}{5} = 20$ [1]

(b) $7m + 3 = 31$ [2]

2. (a) Evaluate 55% of 42·8. [2]

(b) Which one of the following is **not** equal to a recurring decimal?
Circle the correct answer. [1]

$\frac{2}{11}$ $\frac{2}{3}$ $\frac{3}{16}$ $\frac{7}{9}$ $\frac{5}{6}$

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3. ABC is a large triangle, where $AC = 16\,\text{m}$ and $BC = 13\,\text{m}$.

(a) Draw a scale drawing of this triangle using the following scale:

1 cm represents 2 m.

The side AB has already been drawn accurately. [2]

A ——————————————————— B

(b) (i) What is the size of $A\hat{C}B$? [1]

.....

(ii) What is the actual length of AB in the large triangle? [1]

.....

Actual length of AB = ... m

Examiner only

4. (a) A bowl contains 9 litres of water.
400 cm^3 of water is poured out of the bowl.

How much water is left in the bowl?
Circle the correct answer. [1]

50 cm^3 500 cm^3 5 litres 8·6 litres 8·96 litres

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(b) How many minutes are there in 1 day and 5 hours? [2]

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1 day and 5 hours = ... minutes

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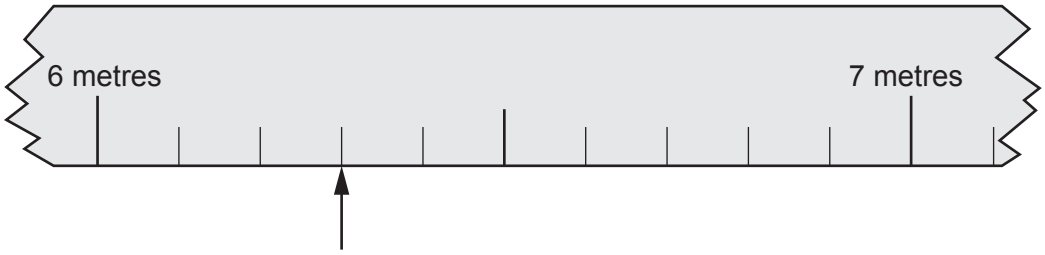
(c) The diagram below shows part of a measuring tape used in a long-jump competition.



The arrow indicates the distance jumped by the competitor who came second.

The winning jump was 676 cm long.

What was the difference between the lengths of these jumps? [3]

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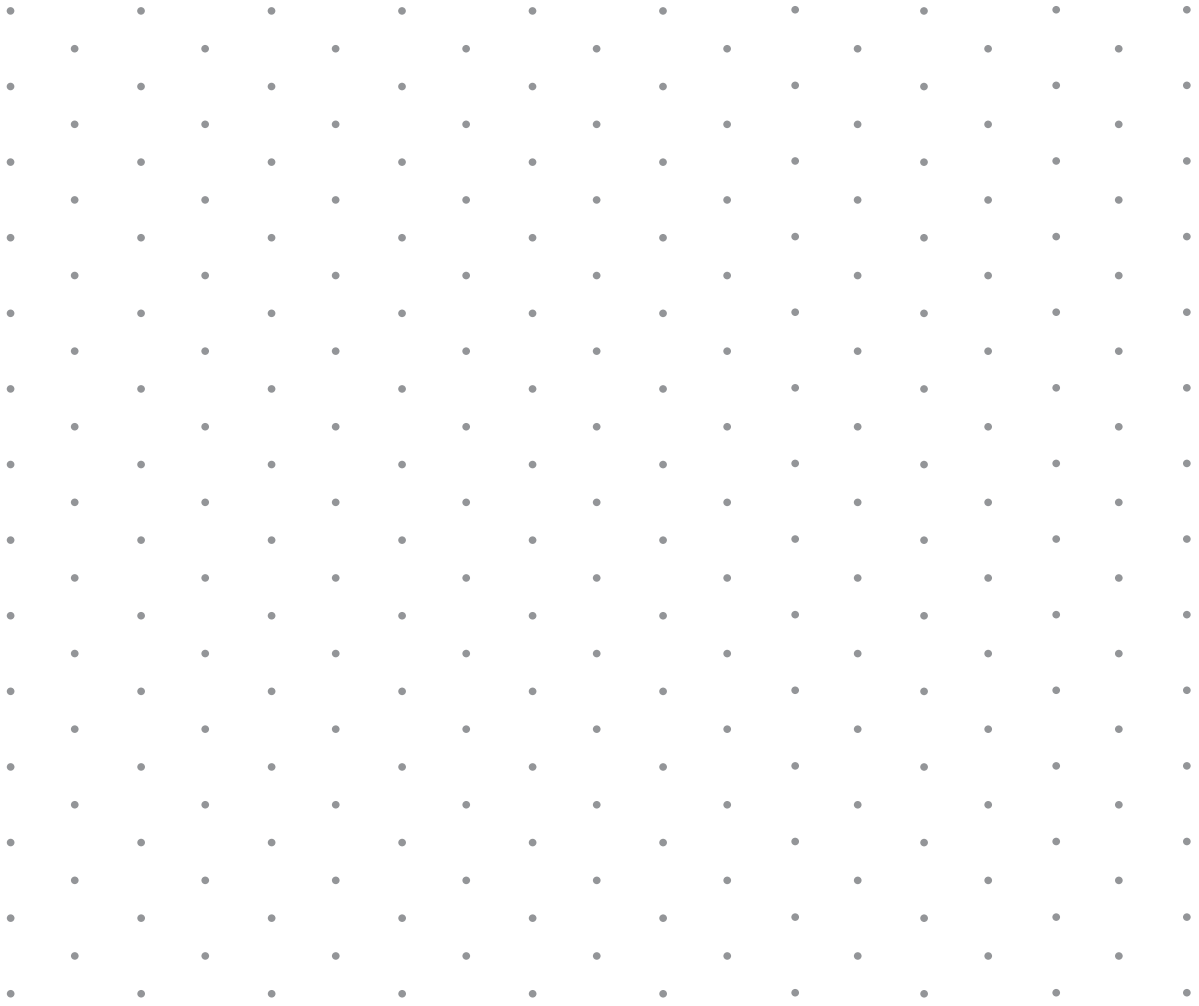
5. (a) Draw an isometric representation of a cuboid measuring 7 cm by 5 cm by 3 cm.
Use the grid below. [2]



(b) Calculate the volume of the cuboid.
You must give the units of your answer. [3]

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Examiner only

6. A children's play area contains a large number of coloured balls.
Some are yellow, some are red, some are blue and the others are pink.

(a) A ball is chosen at random from the play area.
Complete the table below to find the probability of choosing a pink ball. [2]

Colour	Yellow	Red	Blue	Pink
Probability	0·54	0·12	0·25	

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(b) There are 575 blue balls in the play area.

What is the total number of balls in the play area? [2]

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7. Use the formula $v = u + at$ to find the value of t when $v = 51{\cdot}3$, $u = 2{\cdot}3$ and $a = 9{\cdot}8$. [3]

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Examiner only

8. *In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

What is $\frac{1}{3}$ of the time difference between 18:30 today and 10:30 tomorrow?

Give your answer in **hours and minutes**.
You must show all your working. [3 + 2 OCW]

9. Calculate the circumference of a circle with a radius of 38 cm.
Give your answer in cm, correct to 2 significant figures. [3]

Examiner only

10. The employees of a company belong to one of three departments: *Management (M)*, *Sales (S)* or *Distribution (D)*.

The diagram below is a sketch of a pie chart.
The diagram shows the proportion of employees working in each of these departments.

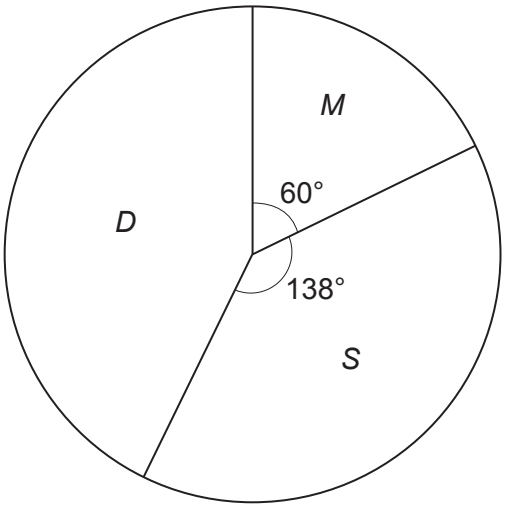

Diagram not drawn to scale

An employee is chosen at random.
Calculate the probability that this employee works in the *Distribution* department.
Give your answer as a decimal. [3]

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Examiner only

11. (a) Evaluate $\sqrt{0{\cdot}9^3 - 0{\cdot}9^4}$. [2]

(b) What is the greatest integer value of n if $2n < 17$? [1]

Greatest integer value of n = ...

(c) What is the least integer value of n if $2^n > 125$? [1]

Least integer value of n = ...

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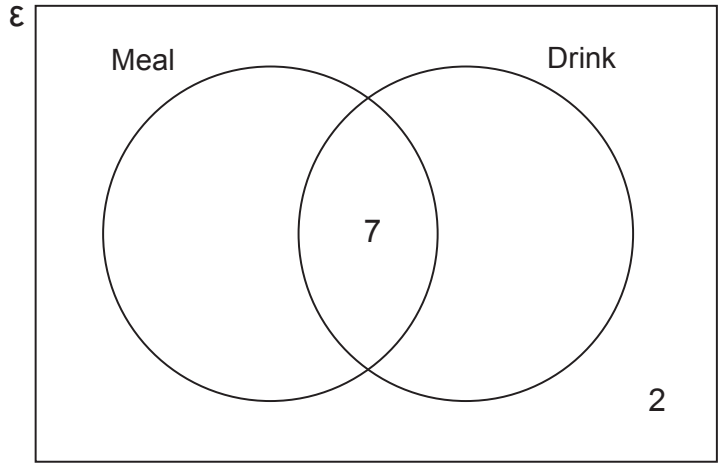
12. At lunchtime on Wednesday, a café had **19 customers**.

- 7 of these customers bought a meal **and** a drink.
- 2 of these customers did not buy a meal **or** a drink.
- The total number of customers who bought a meal was **twice** the total number of customers who bought a drink.

(a) Complete the Venn diagram below to show this information. [2]



(b) One of these customers is chosen at random.
What is the probability that this customer bought a meal? [2]

Examiner only

13. The table below shows some of the values of $y = 2x^2 + 5x - 3$ for values of x from -4 to 2.

x	-4	-3	-2	-1	0	1	2
$y = 2x^2 + 5x - 3$	9	0	-5	-6	-3		15

(a) Complete the table above. [1]

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(b) On the graph paper opposite, draw the graph of $y = 2x^2 + 5x - 3$ for values of x from -4 to 2. [2]

(c) Draw the line $y = 6$ on the graph paper.
Write down the values of x where the line $y = 6$ cuts the curve $y = 2x^2 + 5x - 3$. [2]

Values of x are ..... and .....

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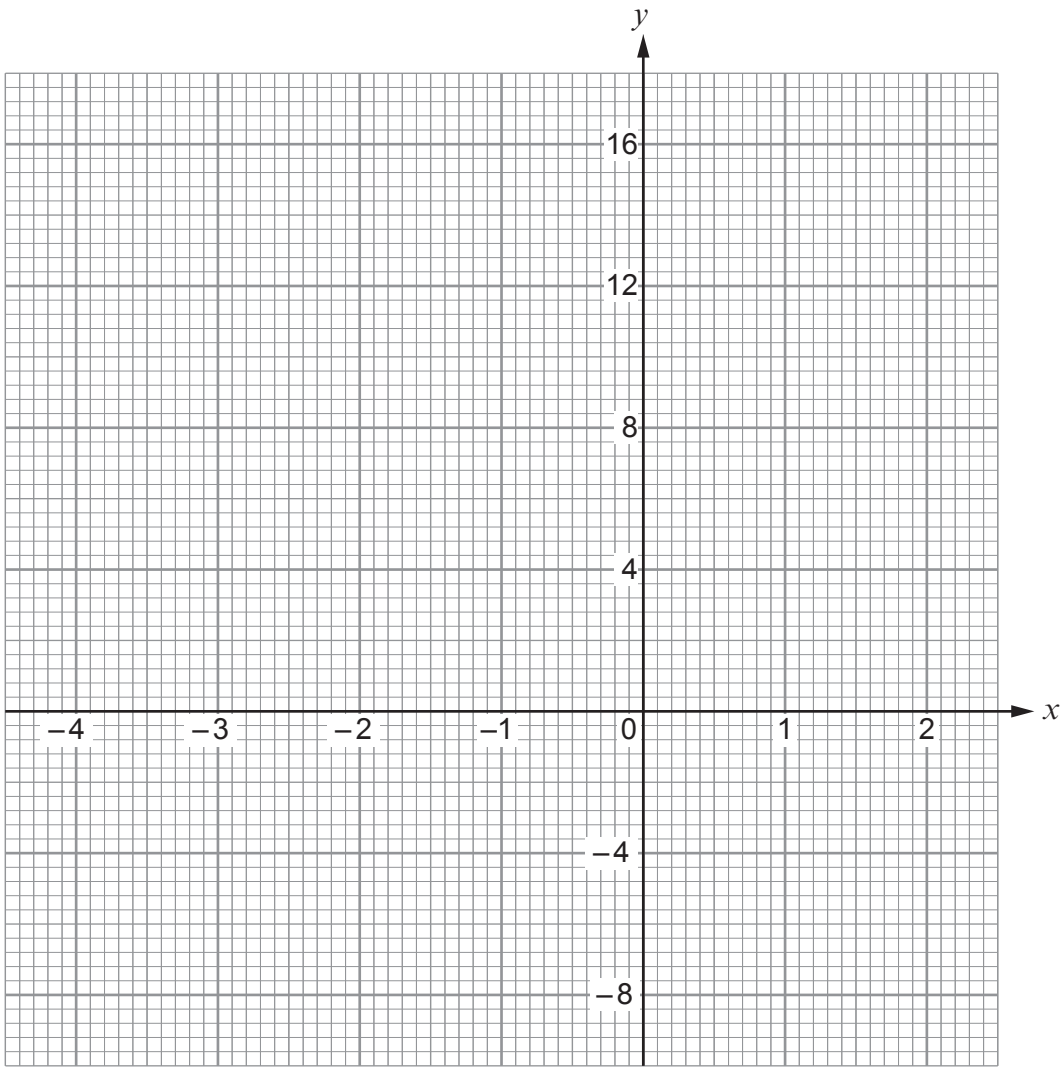

Turn over.

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14. The diagram below shows a water container.
It is formed from an open rectangular tank with a solid cylinder attached to its base inside the tank.

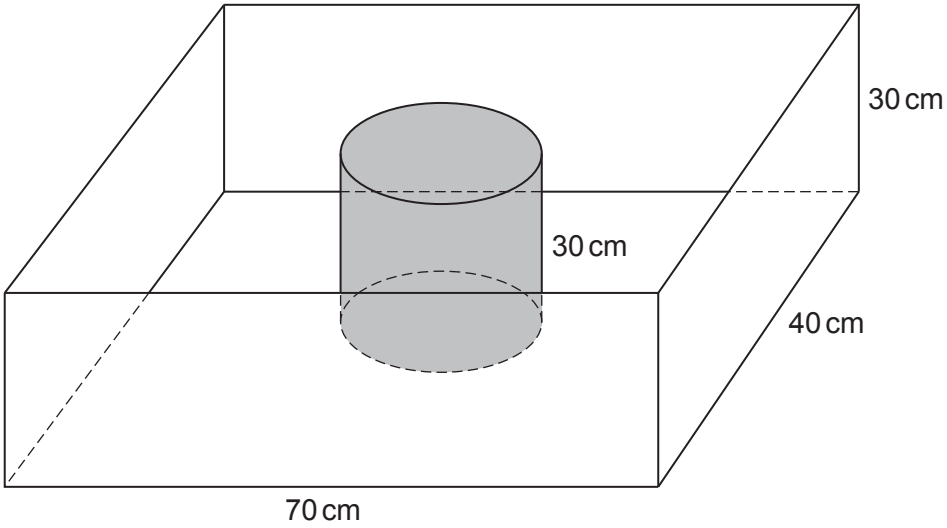

Diagram not drawn to scale

The base radius of the cylinder is 10 cm.
The height of the cylinder is 30 cm.

How many **litres** of water can the container hold?
You must show all your working. [6]

The container can hold ..... litres.

Examiner only

15. The equation of a straight line is $y = -3x + 7$.

(a) What is the gradient of the line?
Circle the correct answer. [1]

$\frac{1}{3}$ $-\frac{1}{3}$ 3 −3 7

(b) What are the coordinates of the point where the line intersects the y-axis?
Circle the correct answer. [1]

(−3, 7) (0, −3) (0, 3) (0, −7) (0, 7)

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16. In the diagram below, *ABD* and *BCD* are both right-angled triangles.

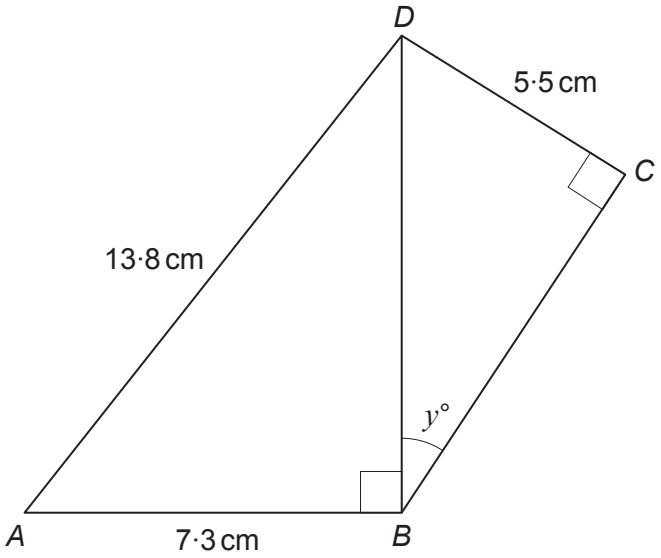

Diagram not drawn to scale

AB = 7·3 cm, *AD* = 13·8 cm and *CD* = 5·5 cm.

Calculate the value of y. [6]

Examiner only

17. Factorise $x^2 + 3x - 40$, and hence solve $x^2 + 3x - 40 = 0$. [3]

18. a and b are two numbers, where $b > a$.

The mean of the two numbers is equal to the range of the two numbers.

Show that $3a = b$. [3]

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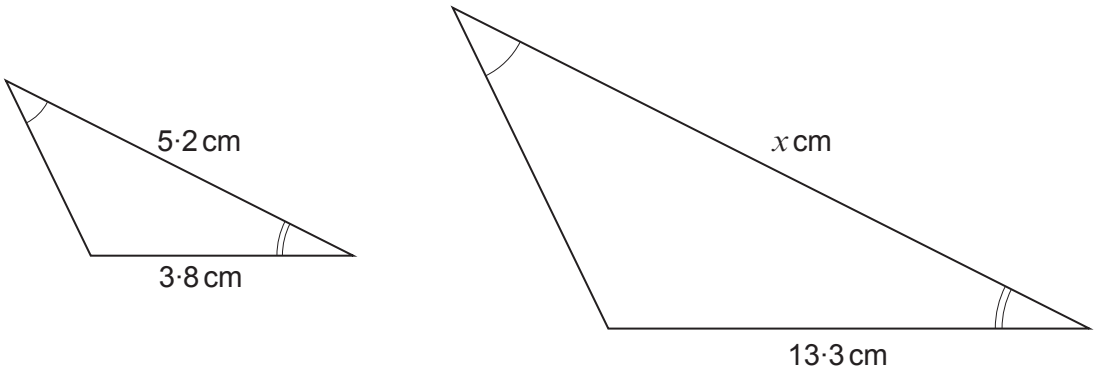
19. (a) The triangles shown below are similar.



Diagrams not drawn to scale

Calculate the value of x. [2]

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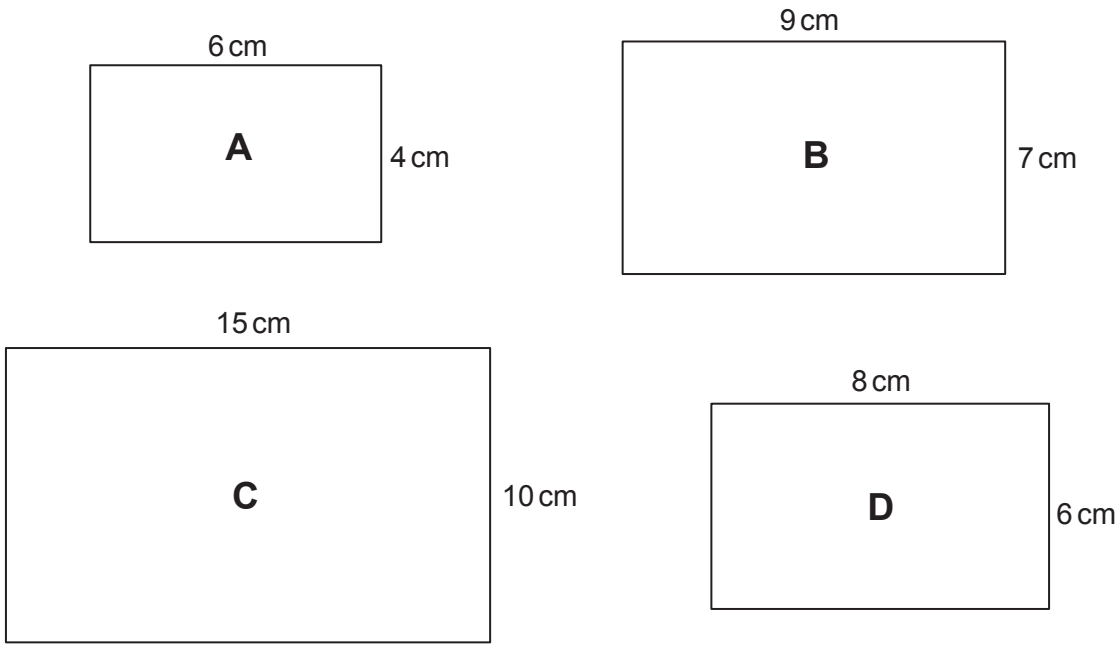
(b) Four rectangles labelled **A**, **B**, **C** and **D** are shown below.



Diagrams not drawn to scale

Which two rectangles are similar?
Give a reason for your choice. [2]

The two rectangles which are similar are rectangles ..... and .....

Reason: .....

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20. Aled and Berwyn share £x in the ratio 2 : 3.

(a) Aled's share of the money is £0·4x.
What is Berwyn's share of the money in terms of x? [1]

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(b) Carys and Delyth share the same amount, £x, in the ratio 3 : 7.

Show that one of these four people receives the same amount as the combined total of two of the other people. [3]

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