



GCSE



C300U10-1

THURSDAY, 16 MAY 2024 – MORNING

MATHEMATICS – COMPONENT 1

NON – CALCULATOR MATHEMATICS

FOUNDATION TIER

**2 hours 15 minutes plus your additional
time allowance**

**THE USE OF A CALCULATOR IS NOT
PERMITTED IN THIS EXAMINATION**

Surname: _____

First name(s): _____

Centre Number: _____

Candidate Number: 0 _____

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	7	
2.	3	
3.	5	
4.	6	
5.	2	
6.	4	
7.	4	
8.	7	
9.	3	
10.	2	
11.	5	
12.	3	
13.	4	
14.	5	
15.	3	
16.	4	
17.	5	
18.	4	
19.	3	
20.	2	
21.	4	
22.	5	
23.	4	
24.	5	
25.	4	
26.	3	
27.	4	
28.	6	
29.	4	
Total	120	

(Turn over)

ADDITIONAL MATERIALS

An additional formulae booklet.

A ruler, a protractor and a pair of compasses may be required.

(Turn over)

**ITEMS INCLUDED WITH QUESTION
PAPER**

A separate Formula List.

A separate Diagram Booklet.

**Cut out shape for Question 13 (a) and
Question 13 (b).**

Models for Question 20.

**The Diagram Booklet MUST be
handed in to the invigilators and
sent for marking.**

(Turn over)

INSTRUCTIONS TO CANDIDATES

Use black ink, black ball – point pen, black felt tip or your usual method.

Write your name, centre number and candidate number in the spaces on the front cover.

Answer ALL questions.

Write your answers in the spaces provided.

If you run out of space, use the additional page(s) at the back of the booklet, taking care to number the questions(s) correctly.

(Turn over)

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.

(Turn over)

Answer ALL questions.

- 1. (a) Write down the value of 2 in the number 1.27**

[1 mark]

- (b) Write 32 928 correct to the nearest 1000**

[1 mark]

continued on the next page . . .

(Turn over)

Question 1 continued

1. (c) Write down the value of 8^2

[1 mark]

(d) Calculate $20 + 4 \div 4$

[1 mark]

continued on the next page . . .

(Turn over)

Question 1 continued

(e) Calculate $0.4 + 0.21$

[1 mark]

continued on the next page . . .

(Turn over)

Question 1 continued

1. (f) Write these numbers in order of size.

Start with the smallest number.

5

−7

3.2

−7.5

Smallest

Largest

[1 mark]

- (g) Write the following inequality in words.

$$-4 < x$$

[1 mark]

(Turn over)

**2. Lewis has a bag containing
10 coloured counters.**

**He chooses one counter from the
bag at random.**

**(a) There is an even chance that
Lewis chooses a blue counter.
How many blue counters are
there in his bag?**

[1 mark]

continued on the next page . . .

(Turn over)

Question 2 continued

2. (b) It is impossible for Lewis to choose a red counter.

How many red counters are there in his bag?

[1 mark]

continued on the next page . . .

(Turn over)

Question 2 continued

- 2. (c) It is unlikely that Lewis chooses a yellow counter.**

What is the smallest number of yellow counters that Lewis could have in his bag?

[1 mark]

(Turn over)

3. (a) Write $\frac{3}{50}$ as a percentage.

[1 mark]

continued on the next page . . .

Question 3 continued

(Turn over)

3. (b) Calculate $\frac{3}{5}$ of 20

[2 marks]

continued on the next page . . .

Question 3 continued

(Turn over)

3. (c) Calculate 70% of 50

[2 marks]

(Turn over)

- 4. (a) Kelly is planning a family trip to the zoo.**

The 2 adults and 3 children will all travel in the same car.

Each person will need an entrance ticket and lunch.

The costs for the trip are:

Petrol	£40
Tickets to the zoo	£15 per adult £10 per child
Lunch	£12 per adult £7 per child

continued on the next page . . .

(Turn over)

Question 4 (a) continued

Kelly has £180 to spend on the trip.

She pays for the petrol, the tickets and the lunches.

How much money will she have left?

(Turn over)

(Turn over)

Kelly has _____ left.

[4 marks]

[4 marks]

Question 4 continued

(Turn over)

- 4. (b) Last year, 10% of visitors to the zoo bought a bag of animal feed. This year the zoo expects 650 000 visitors.**

How many bags of animal feed do they expect to sell this year?

(Turn over)

[2 marks]

- 5. (a) Circle the expression that is the same as '4 more than y '.**

(Turn over)

$$y - 4$$

$$4 + y$$

$$\frac{4}{y}$$

$$4y$$

$$\frac{y}{4}$$

[1 mark]

continued
page . . .

on the next

Question 5 continued

(Turn over)

- 5. (b) Calculate the value of $-8x$
when $x = -3$**

[1 mark]

(Turn over)

6. Look at the diagram for Question 6 in the separate Diagram Booklet.

The diagram shows point *A* on a coordinate grid.

(a) On the grid, plot the point *B* (5, −2)

[1 mark]

(b) *ABC* is a triangle with a right – angle at *C*.

Plot the position of the point *C*.

[1 mark]

continued on the next page . . .

(Turn over)

Question 6 continued

- 6. (c) Find the coordinates of the midpoint of the line AB .**

Coordinates of the midpoint of line AB are

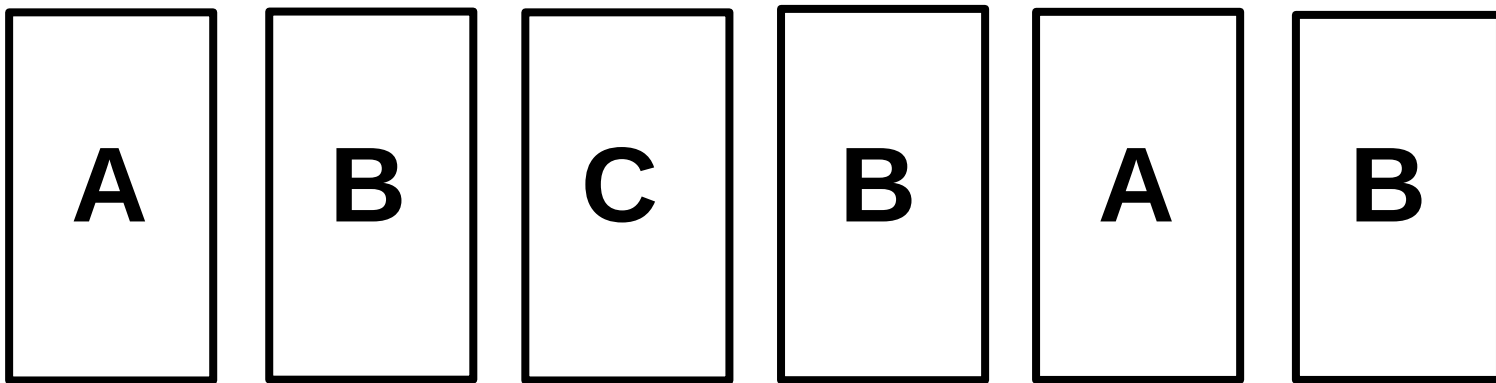
(_____ , _____)

[2 marks]

(Turn over)

7. David has 6 cards.

Each card has a letter on it.



(a) Which letter is the mode?

[1 mark]

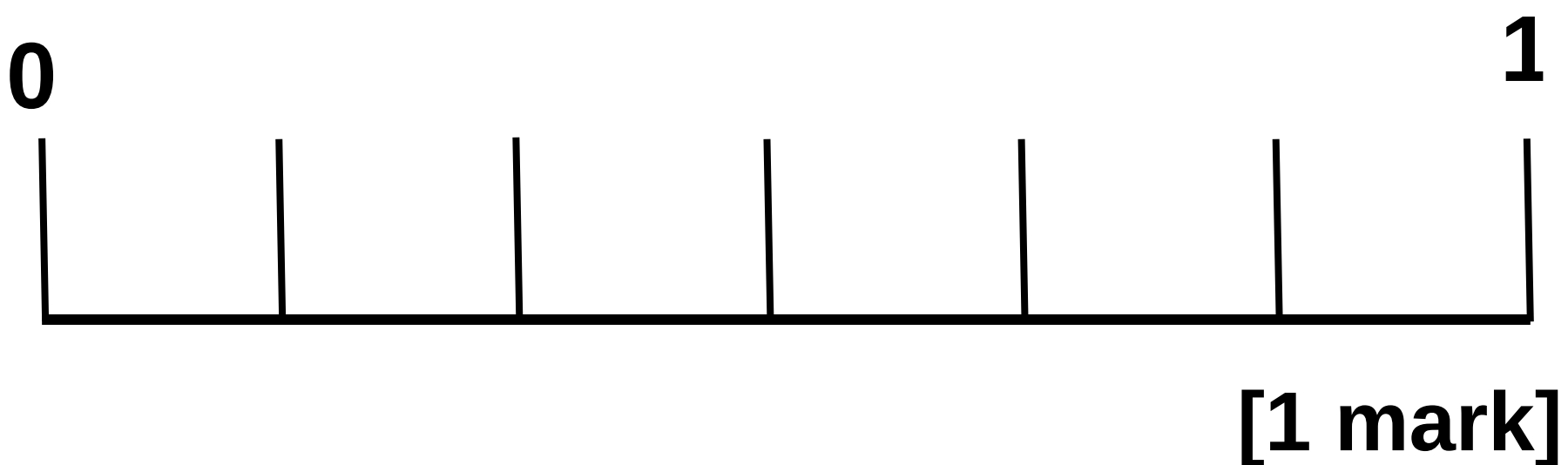
continued on the next page . . .

(Turn over)

Question 7 continued

7. (b) One of the cards is chosen at random.

(i) On the probability scale below, mark with an arrow ($\downarrow$) the probability that the card chosen has a letter A on it.



continued on the next page . . .

Question 7 (b) continued

(Turn over)

- 7. (b) (ii) Write down the probability that the card chosen has a letter C on it.**

[1 mark]

continued on the next page . . .

Question 7 continued

(Turn over)

7. (c) Write down the ratio of the number of cards with a letter A to the number of cards with a letter B.

A : B = _____ **:** _____

[1 mark]

8. (a) Simplify $4xw \times 3xy$.

(Turn over)

[1 mark]

**(b) In EACH of the spaces below,
write a term to make the
statement correct.**

$$f + \underline{\hspace{2cm}} - \underline{\hspace{2cm}} = 6f$$

[1 mark]

continued on the next page . . .

Question 8 continued

(Turn over)

8. (c) Solve each of the following equations.

(i) $6x = 48$

[1 mark]

continued on the next page . . .

(Turn over)

Question 8 (c) continued

8. (c) (ii) $\frac{p}{4} = 40$

[1 mark]

Question 8 continued

(Turn over)

8. (d) Twowheels is a bike hire company.

Customers can hire bikes from Twowheels for a whole number of days.

The company uses the following formula to calculate its hire costs.

Bike hire cost

= £20 + £15 × number of hire days

Tom wants to hire a bike from Twowheels.

continued on the next page

Question 8 (d) continued

(Turn over)

He has £150 to spend.

What is the greatest number of days for which Tom can hire a bike?

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

(Turn over)

Tom can hire a bike for _____ days

[3 marks]

9. Look at the diagram for Question 9 in the separate Diagram Booklet.

(Turn over)

The diagram shows a conversion graph.

The conversion graph can be used to convert between acres and hectares.

Use the graph to answer the following questions.

- (a) How many acres are equal to 4.5 hectares?**

[1 mark]

continued on the next page . . .

Question 9 continued

- 9. (b) Complete the following**

(Turn over)

statement.

You must show all your working.

25 acres is equal to _____ hectares

[2 marks]

- 10. A shop that sells scented candles is holding a sale. The original price of each candle was £3**

(Turn over)

In the sale, the candles are sold at half price.

Sam has £38

Sam thinks that the maximum number of candles that she can now buy is exactly twice as many as she could buy at the original price.

Is Sam correct?

☐

Yes

☐

No

continued on the next page . . .

Question 10 continued

You must explain your reasoning.

(Turn over)

[2 marks]

**11. Look at the table for Question 11
in the separate Diagram Booklet.**

(Turn over)

**The table shows part of a train
timetable between London
Paddington and Bristol Parkway.**

**(a) Darren catches the 19:48 train
from London Paddington to
Bristol Parkway.**

**How many MINUTES should his
train journey take?**

(Turn over)

[2 marks]

continued on the next page . . .

(Turn over)

Question 11 continued

11. (b) Jennifer lives in London.

She went to an event in Swindon.

**Jennifer left her house
at 6:10 p.m.**

**It took her 10 minutes to get to
London Paddington station.**

**She then took the next train
to Swindon.**

**This train arrived in Swindon
on time.**

**It then took her 12 minutes to get
to the event.**

continued on the next page . . .

(Turn over)

Question 11 (b) continued

The event started at 7:45 p.m.

How many minutes late did

Jennifer arrive at the event?

You must show your working.

(Turn over)

Jennifer arrived _____ minutes late
[3 marks]

12. (a) Lisa, Flynn and Jane each have a
(Turn over)

number of marbles.

Jane has 8 marbles.

**Jane has half as many marbles
as Flynn.**

**Flynn has 4 times as many
marbles as Lisa.**

**Write the numbers of marbles
they each have as a ratio.**

**Give your answer in its simplest
form.**

(Turn over)

Lisa : Flynn : Jane =

_____ : _____ : _____

[2 marks]

continued on the next page . . .

(Turn over)

Question 12 continued

**12. (b) Siân is trying to write
2 m to 30 cm
as a ratio in its simplest form.
Here is her working.**

“2 m : 30 cm

1 m : 15 cm

Answer: 1 : 15”

**Explain why Siân’s answer is
NOT correct.**

(Turn over)

[1 mark]

(Turn over)

13. (a) Look at the diagram for Question 13 (a) in the separate Diagram Booklet.

The diagram shows triangle T on a coordinate grid.

Reflect the triangle T in the line $y = 1$

A cut out triangle is provided for this question.

[2 marks]

continued on the next page . . .

Question 13 continued

(Turn over)

- 13. (b) Look at the diagram for Question 13 (b) in the separate Diagram Booklet.**

The diagram shows a grid.

Shade the least number of squares in the lower two quadrants so that the grid has rotational symmetry of order 2

Cut out squares are provided for this question.

[2 marks]

- 14. (a) Suzanne drives from Liverpool to Hull.**

(Turn over)

**She drives at an average speed
of 52 miles per hour**

for $2\frac{1}{2}$ hours.

**Calculate the distance that
Suzanne travels.**

(Turn over)

Suzanne travels _____ miles

[2 marks]

continued on the next page . . .

(Turn over)

Question 14 continued

**14. (b) Suzanne planned her journey
using a map.**

**The map has a scale
of 1:200 000**

**On the map, the distance
between two roundabouts
measures 3 cm.**

**What is the actual distance
in KILOMETRES?**

(Turn over)

The actual distance is _____ km

[3 marks]

(Turn over)

15. (a) Factorise $3p + 7pq$

[1 mark]

(b) Make w the subject of the formula

$$y = 5w - 4$$

(Turn over)

[2 marks]

16. Look at the diagram for Question 16 in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

The diagram shows triangle ABC and triangle ACD.

Line BCD is extended to point E.

BE is a straight line.

Angle ADE = x

Show that $x = 150^\circ$

continued on the next page . . .

(Turn over)

Question 16 continued

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

(Turn over)

[4 marks]

(Turn over)

17. (a) Calculate $0.4 \div 0.01$

[1 mark]

**(b) Calculate each of the following.
Give your answers in their
simplest form.**

(i) $\frac{1}{4} + \frac{3}{5}$

(Turn over)

[2 marks]

continued on the next page . . .

(Turn over)

Question 17 continued

17. (b) (ii) $\frac{5}{6} \times \frac{3}{10}$

[2 marks]

(Turn over)

18. Look at the diagram for Question 18 in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

The diagram shows rectangle $ABCD$

$DC = 2x + 3$ cm and $DA = 12$ cm.

The perimeter of the rectangle is 40 cm.

Calculate the value of x .

(Turn over)

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

$X =$ _____

[4 marks]

(Turn over)

19. Write down five positive whole numbers in the boxes given such that the numbers have:

- a range of 5 AND**
- a mean of 4 AND**
- a median of 3**

(Turn over)

☐☐☐☐☐

[3 marks]

(Turn over)

**20. Ask for the models for Question 20.
The models are NOT made to scale.**

Robin makes Cube A and Cube B.

**Both cubes are made up of smaller
cubes.**

**The smaller cubes represent a
one centimetre cube.**

**Sarah uses ALL of Robin's
centimetre cubes to make a SINGLE
cuboid.**

continued on the next page . . .

Question 20 continued

(Turn over)

Each of the dimensions of Sarah's cuboid will be greater than one centimetre.

Give the dimensions of a cuboid that Sarah could make.

(Turn over)

[2 marks]

(Turn over)

21. (a) ESTIMATE the value of

$$\frac{2.13 \times 99.4}{39.5}$$

You must show all your working.

[2 marks]

continued on the next page . . .

(Turn over)

Question 21 continued

**21. (b) Given that $3 \cdot 4 \times 7 \cdot 8 = 26 \cdot 52$,
write down the answer to:**

(i) 34×78

[1 mark]

continued on the next page

(Turn over)

Question 21 (b) continued

**21. (b) Given that $3 \cdot 4 \times 7 \cdot 8 = 26 \cdot 52$,
write down the answer to:**

(ii) $\frac{26 \cdot 52}{34}$

[1 mark]

**22. (a) Write 2475 as a product of its
(Turn over)**

72

prime factors in index form.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

(Turn over)

[3 marks]

**22. (b) Write down the square root
of $64 \times 5^4 \times 7^4$**

**Give your answer as a product of
prime factors in index form.**

[2 marks]

(Turn over)

23. Pippa and Joe are working on a school project.

The project is based on the use of the local leisure facilities.

(a) Pippa decides to ask adults how much they spend on gym membership each month.

Look at the box on the next page, write a suitable question with appropriate response boxes to collect this information.

continued on the next page . . .

(Turn over)

Question 23 (a) continued**QUESTION**

RESPONSE BOXES**[2 marks]****continued on the next page . . .****(Turn over)**

Question 23 continued

23. (b) Joe asked some adults how many hours they each spent at the leisure centre during the previous week.

His results are shown below.

NUMBER OF HOURS	NUMBER OF ADULTS
0 – 4	9
5 – 9	2
10 – 14	1
15 – 19	1
20 – 24	2

continued on the next page . . .

(Turn over)

Question 23 (b) continued

Joe accurately calculated an estimate of the mean time spent per adult to be 7 hours.

In his project he stated:

‘On average, the adults in my survey each spent 7 hours at the leisure centre last week.’

continued on the next page . . .

(Turn over)

Question 23 (b) continued

23. (b) (i) Explain why the mean is not the best average to use for this data.

[1 mark]

continued on the next page . . .

(Turn over)

Question 23 (b) continued

**23. (b) (ii) Give ONE other reason
why Joe's results may not
be reliable.**

[1 mark]

(Turn over)

24. An empty water tank is filled using a hose with a steady rate of flow.

The tank takes:

- **30 minutes to fill if water is added at x litres/min**
- **40 minutes to fill if the water is added at $(x - 2)$ litres/min.**

Form an equation, in terms of x .

Solve the equation and hence find the capacity of the tank in litres.

(Turn over)

(Turn over)

25. Three friends, Louis, Krystal and Jamal win some money in a competition.

They share the money in the ratio 3 : 7 : 11

(a) What fraction of the total money won is given to Jamal?

[1 mark]

continued on the next page . . .

Question 25 continued

(Turn over)

25. (b) JAMAL spends £45 of the money he won.

He now has exactly twice as much as LOUIS won.

How much money did KRYSTAL win?

(Turn over)

[3 marks]

(Turn over)

26. 6 printers take 36 minutes to print a number of identical booklets.

How long will it take 9 printers to print HALF as many of these booklets?

You may assume that all printers print at the same rate.

(Turn over)

[3 marks]

(Turn over)

27. (a) The price of an item in a sale has been reduced by 25%.

If the sale price is £54, what was the original price of the item?

[2 marks]

continued on the next page . . .

(Turn over)

Question 27 continued

27. (b) Percentage change can be calculated using multipliers.

(i) A number is decreased by 33% of its value.

Circle the multiplier that would find the value after this decrease.

0.67
−1.33
−0.67
0.33
0.77

[1 mark]

continued on the next page . . .

(Turn over)

Question 27 (b) continued

27. (b) (ii) A number is increased by 6% of its value.

This is done 3 times, each time increasing the previous value by 6%.

Circle the multiplier that would find the value after the 3 increases.

1.06
1.18
1.06^3
0.18
0.06^3

[1 mark]

(Turn over)

28. Three friends, Luka, Mali and Nina buy some fruit.

Luka buys 3 apples and 4 bananas and pays £2.70

Mali buys 2 apples and 3 bananas and pays £1.95

Use an algebraic method to calculate how much Nina pays for 4 apples and 2 bananas.

(Turn over)

(Turn over)

[illegible]

(Turn over)

Nina pays _____

[6 marks]

(Turn over)

29. (a) Calculate the value of

$$\frac{1.29 \times 10^5}{3 \times 10^{-7}}$$

**Give your answer in
standard form.**

[2 marks]

continued on the next page . . .

(Turn over)

Question 29 continued

29. (b) Calculate the value of
 $(7.6 \times 10^5) + (3 \times 10^4)$

Give your answer in
standard form.

(Turn over)

[2 marks]

END OF PAPER
TOTAL 120 MARKS

(Turn over)

[illegible]

(Turn over)

[illegible]

(Turn over)

[illegible]

(Turn over)

[illegible]

C300U10-1

THURSDAY, 16 MAY 2024 – MORNING

**MATHEMATICS – COMPONENT 1
NON – CALCULATOR MATHEMATICS
FOUNDATION TIER**

**The Diagram Booklet MUST
be handed in to the invigilators
and sent for marking.**

Diagram Booklet

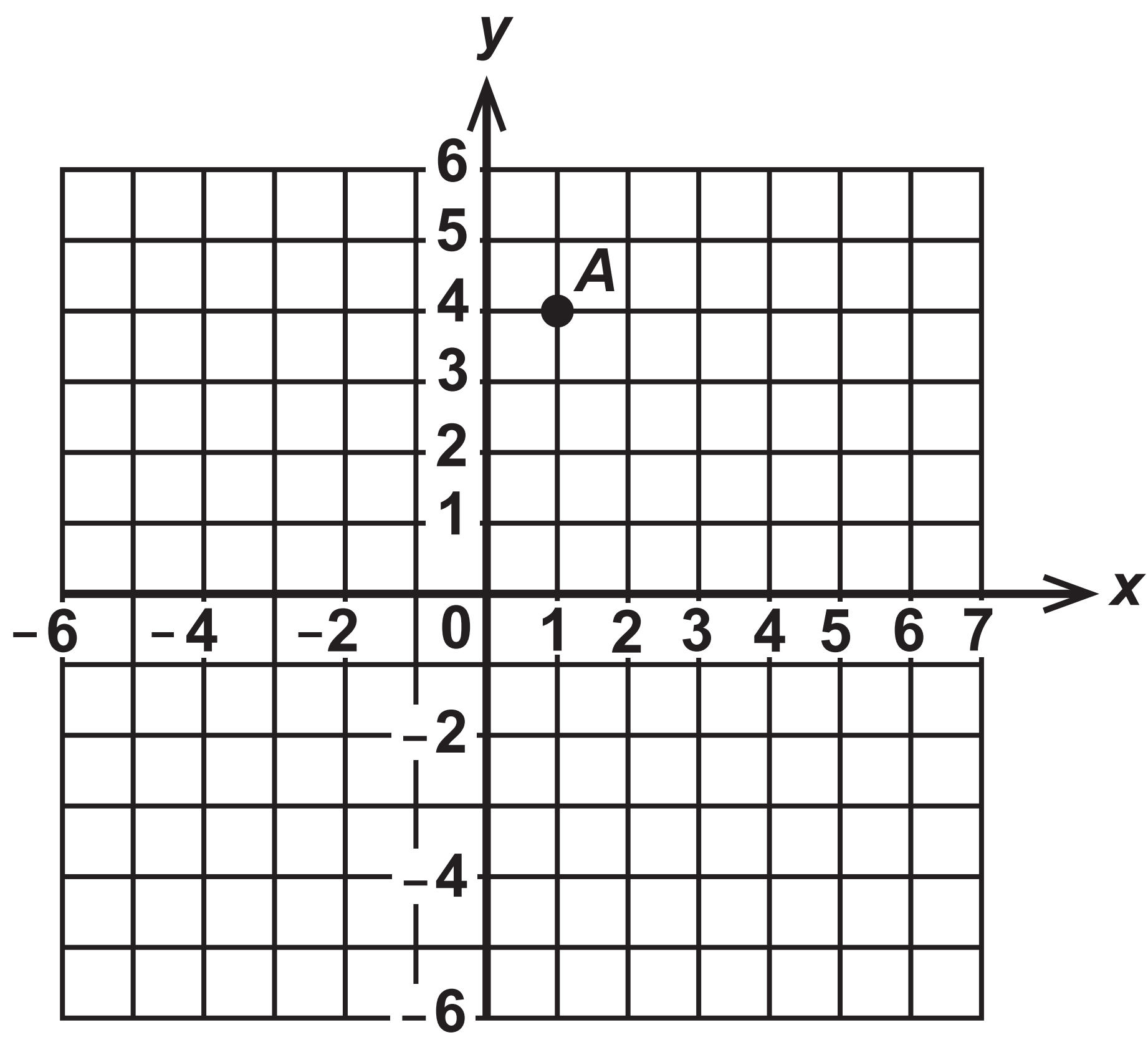
Surname: _____

First name(s): _____

Centre Number: _____

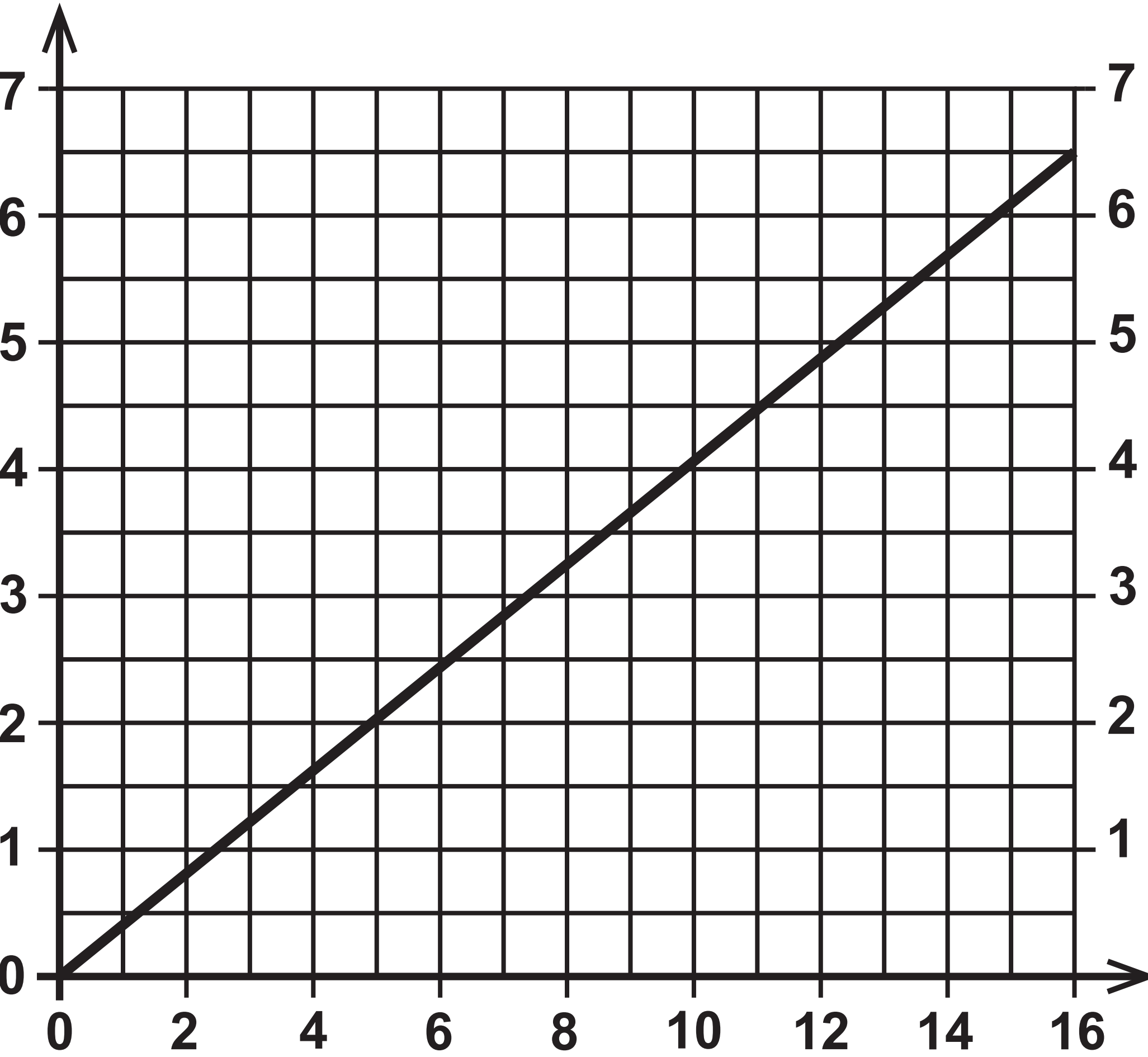
Candidate Number: 0 _____

Question 6



Question 9

hectares



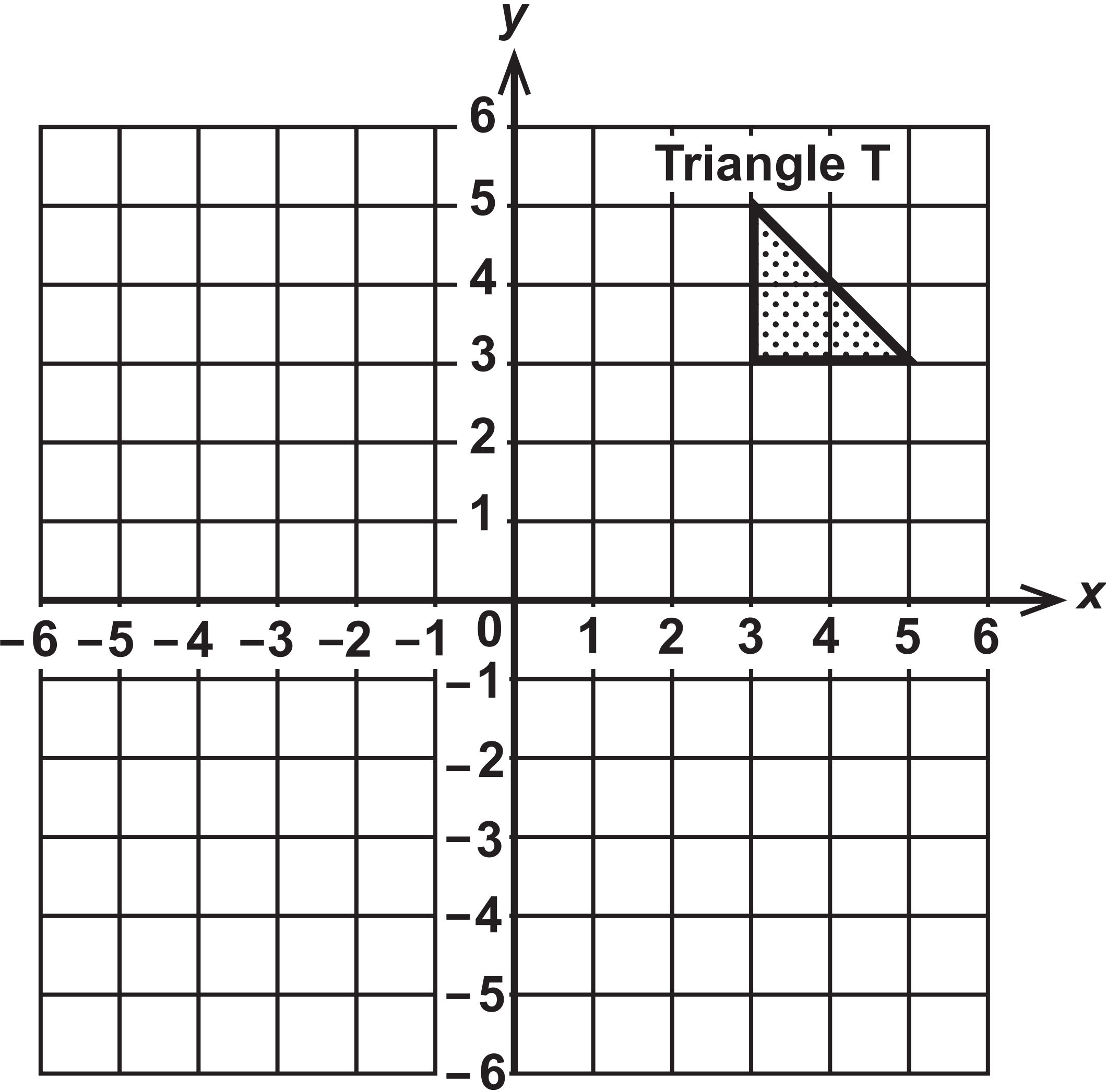
acres

Question 11

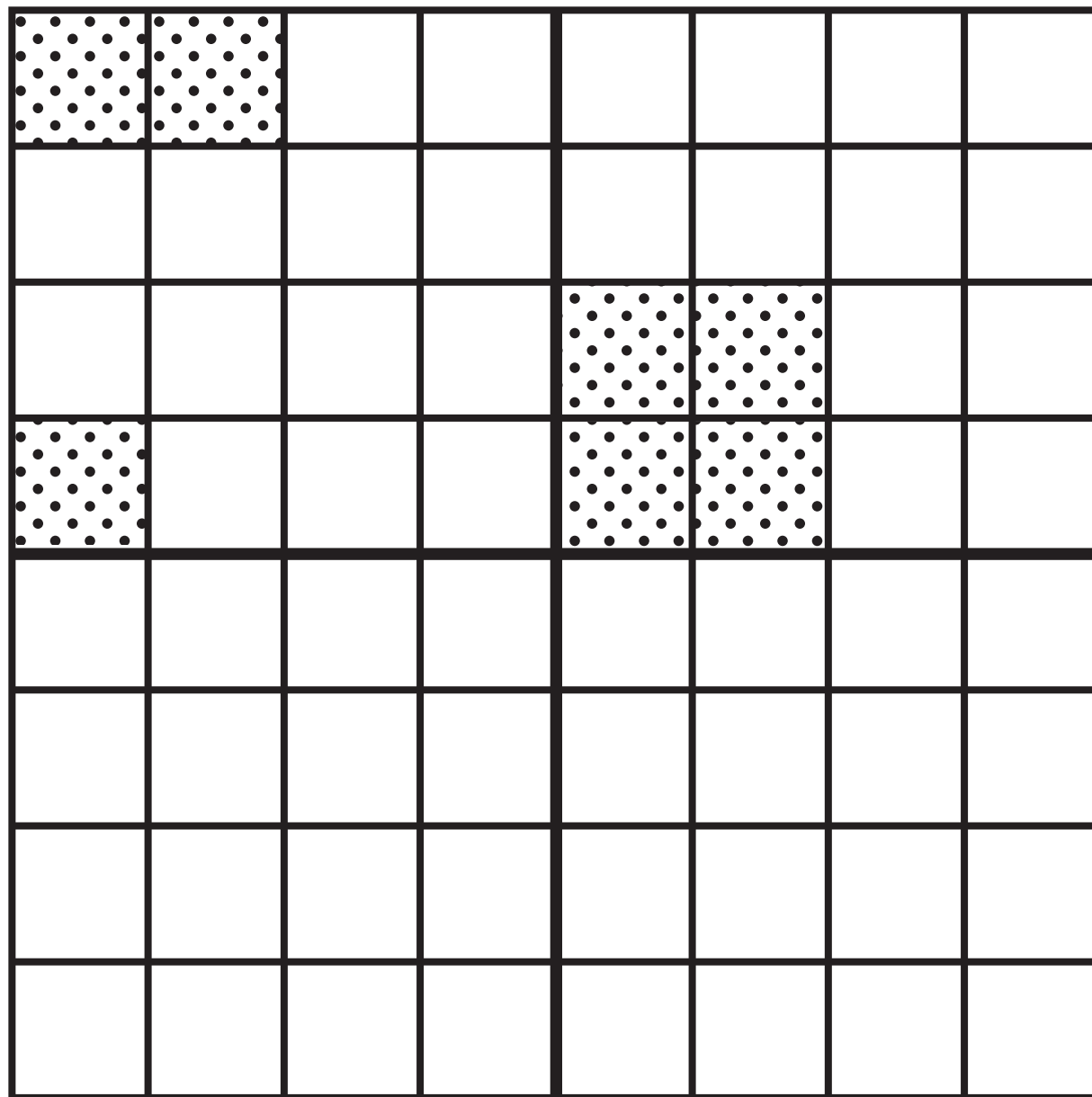
Table

London Paddington	18:01	18:18	18:43	19:18	19:48	20:01
Reading		18:43	19:10	19:43	20:13	
Swindon		19:10	19:37	20:10	20:40	
Bristol Parkway	19:46	19:51	19:59	20:31	21:01	21:56

Question 13 (a)

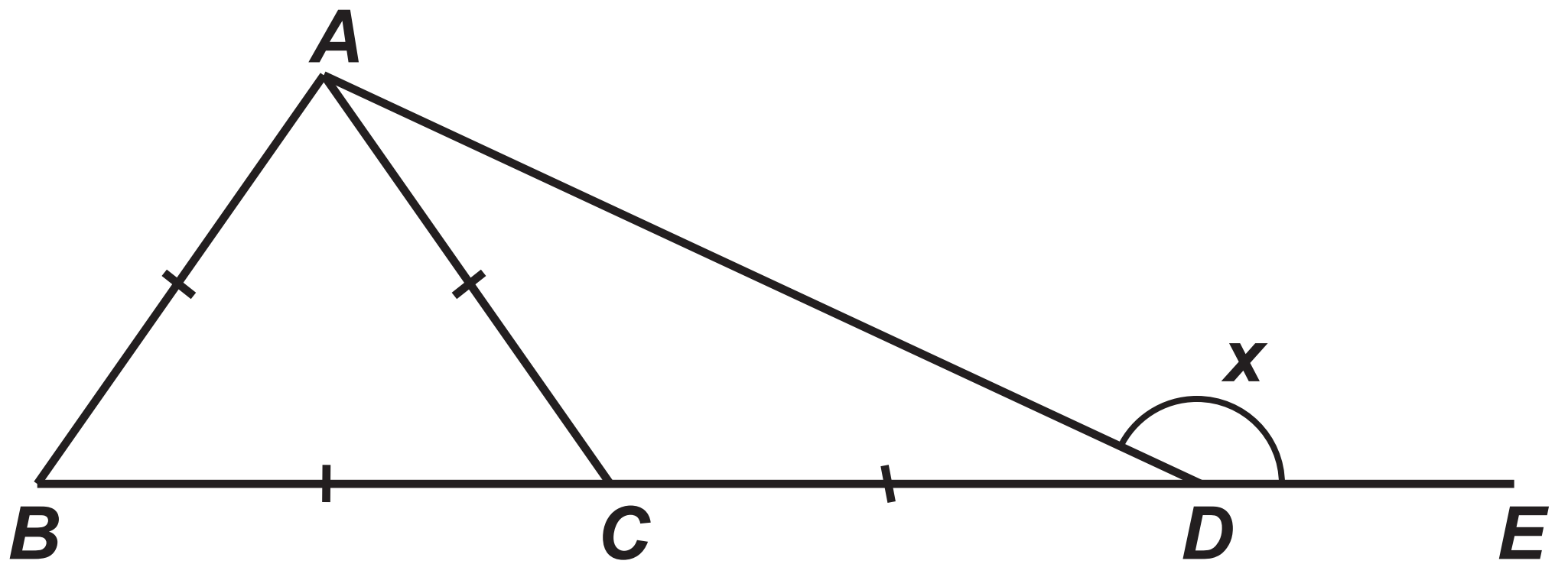


Question 13 (b)



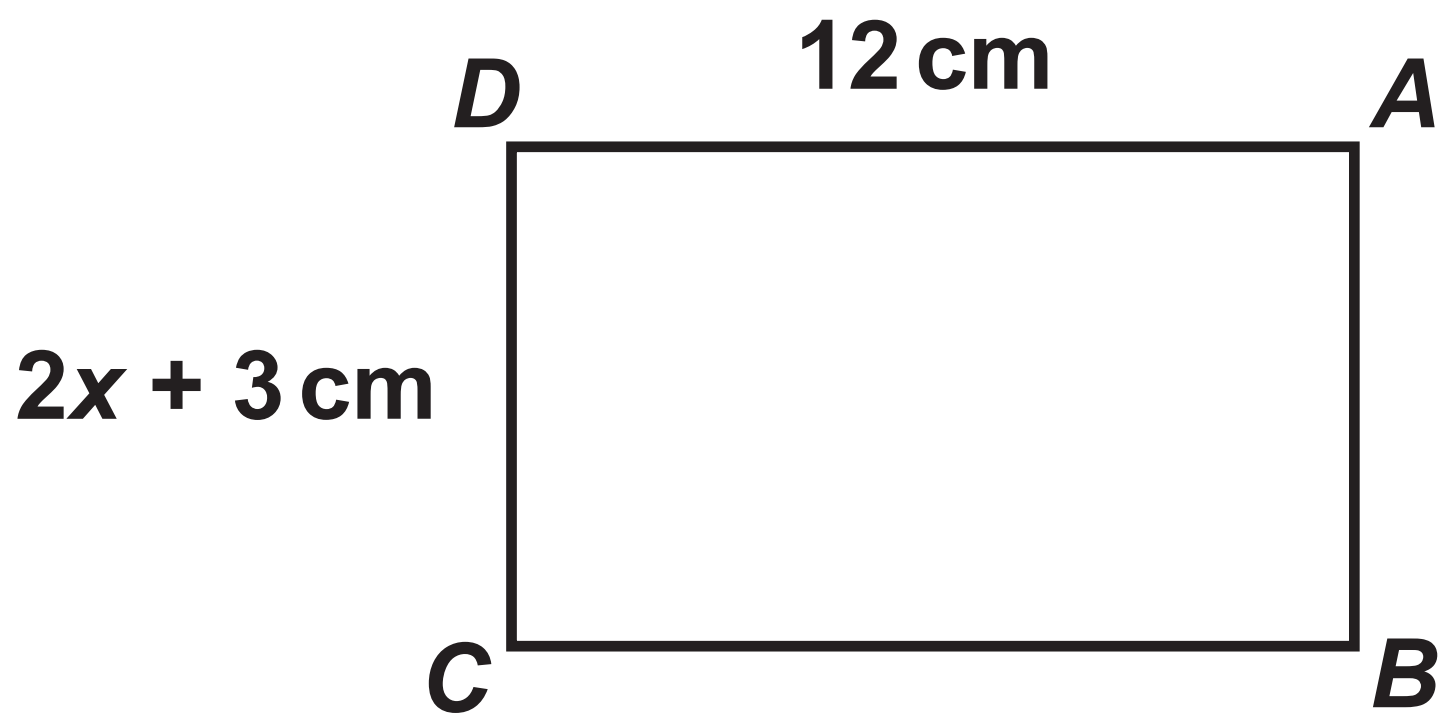
Question 16

Diagram NOT drawn to scale



Question 18

Diagram NOT drawn to scale



C300U10-1A

THURSDAY, 16 MAY 2024 – MORNING

MATHEMATICS

FOUNDATION TIER

Additional Formulae

PERIMETER, AREA AND VOLUME

Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

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

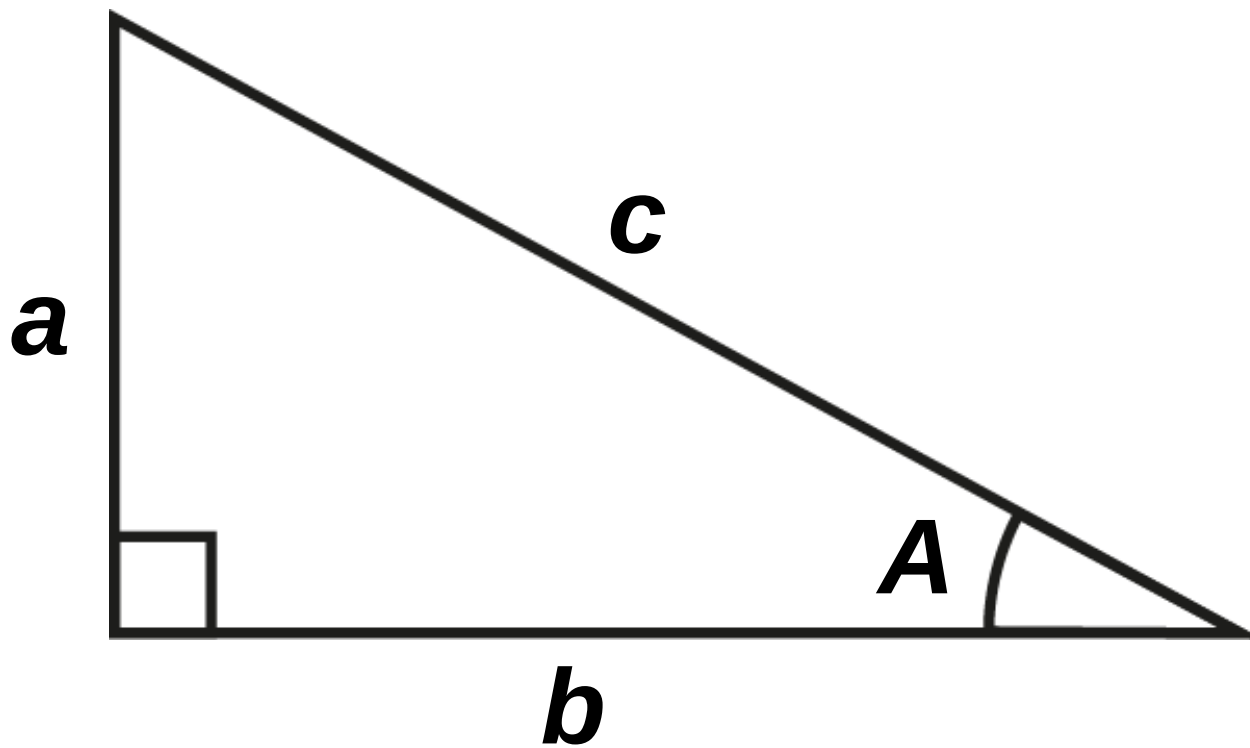
**Volume of a prism =
area of cross section $\times$ length**

**Where r is the radius and
 d is the diameter:**

$$\text{Circumference of a circle} = 2\pi r = \pi d$$

$$\text{Area of a circle} = \pi r^2$$

PYTHAGORAS' THEOREM AND TRIGONOMETRY



In any right – angled triangle where a , b and c are the length of the sides and c is the hypotenuse:

$$a^2 + b^2 = c^2$$

In any right – angled triangle ABC where a , b and c are the length of the sides and c is the hypotenuse:

$$\sin A = \frac{a}{c} \quad \cos A = \frac{b}{c} \quad \tan A = \frac{a}{b}$$

COMPOUND INTEREST

Where P is the principal amount,
 r is the interest rate over a given period
and n is number of times that the
interest is compounded:

$$\text{Total accrued} = P \left(1 + \frac{r}{100} \right)^n$$

PROBABILITY

Where $P(A)$ is the probability of
outcome A and $P(B)$ is the probability
of outcome B :

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

MATHEMATICS

**FORMULA LIST
FOUNDATION TIER
AND HIGHER TIER
GCSE**

You must not write on these formulae pages.

Anything you write on these formulae pages will gain NO credit.

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:

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

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

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

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:

$$v = u + at$$

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

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