



**GCSE**



**C300UB0-1**

**TUESDAY, 7 JUNE 2022 – MORNING**

**MATHEMATICS – COMPONENT 2**

**CALCULATOR – ALLOWED MATHEMATICS**

**HIGHER TIER**

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

**A CALCULATOR WILL BE REQUIRED  
FOR THIS EXAMINATION**

**Surname:** \_\_\_\_\_

**First name(s):** \_\_\_\_\_

**Centre Number:** \_\_\_\_\_

**Candidate Number:** 0 \_\_\_\_\_

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

(Turn over)

**ADDITIONAL MATERIALS**

**An additional formulae booklet.**

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

**ITEMS INCLUDED WITH QUESTION PAPER**

**A separate Formula List.**

**A separate Diagram Booklet.**

**Models for Question 8.**

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

**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 question(s) correctly.

Take  $\pi$  as 3.142 or use the  $\pi$  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.**

**You are reminded of the need for good English and orderly, clear presentation in your answers.**

1. The table below shows the mass of **90** carrots grown by a gardener.

| Mass, $m$ (grams)  | Number of carrots |
|--------------------|-------------------|
| $30 < m \leq 60$   | 9                 |
| $60 < m \leq 90$   | 33                |
| $90 < m \leq 120$  | 38                |
| $120 < m \leq 150$ | 8                 |
| $150 < m \leq 180$ | 2                 |

Calculate an estimate for the mean mass of these carrots.

---

---

---

---

---

---

**6**

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**[4 marks]**

**(Turn over)**

2. Jan, Freda and Pieter share some money.

Freda gets **3** times as much as Jan.

Pieter gets half as much as Freda.

(a) Write down the ratio of the amounts  
of money that they each get.

Give your answer in its simplest form.

---

---

---

---

---

Jan : Freda : Pieter = \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_

[2 marks]

continued on the next page . . .

(Turn over)

**Question 2 continued**

2. (b) What fraction of the money does Pieter get?

---

---

---

---

---

**[1 mark]**

**(Turn over)**

3.

|                                                |
|------------------------------------------------|
| <p><b>EDUDIG Digger</b><br/><b>£35 950</b></p> |
|------------------------------------------------|

Samir buys this digger and expects to use it for **1250** hours each year.

The digger will decrease in value at a yearly rate of **18%** of its value at the end of the previous year.

Use this information to calculate the decrease in value of Samir's digger when it has been used for **10 000** hours.

---

---

---

---

---

---

---

---

(Turn over)

**10**

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**[5 marks]**

**(Turn over)**

4. A circular wheel makes **42** complete turns each minute.

- (a) How many degrees does it turn through in one second?**

[illegible]

---

---

---

---

[3 marks]

4. (b) (i) State ONE assumption you have made in your answer to part (a).

---

---

---

---

---

[1 mark]

continued on the next page . . .

(Turn over)

**Question 4 (b) continued**

- 4. (b) (ii) How would your answer to part (a) change if this assumption was not correct?**

---

---

---

---

---

**[1 mark]**

**(Turn over)**

5. (a) Solve  $2x + 5 = 11 + 5x$

---

---

---

---

---

---

[2 marks]

continued on the next page . . .

(Turn over)

**Question 5 continued**

5. (b) Solve  $8x - (3x + 1) = 2$

**Give your answer as a fraction.**

---

---

---

---

---

---

---

---

---

---

**[3 marks]**

**continued on the next page . . .**

**(Turn over)**

## Question 5 continued

5. (c) Tansy is trying to solve  $1 < x + 2 \leq 5$   
where  $x$  is a whole number.  
Here is her work.

$$1 - 2 < x \text{ and } x \leq 5 - 2$$

$$-1 < x \text{ and } x \leq 3$$

$$-1 < x \leq 3$$

$x$  is  $-1, 0, 1, 2$  or  $3$

Ali says,

“You have made an error.”

Is Ali correct?

Yes ☐

No ☐

Show clearly how you decide.

---

---

---

---

---

---

---

---

[1 mark]

5. (d) Look at the diagram for Question 5 (d) in the separate Diagram Booklet.

The diagram shows a number line.

Represent the inequality  $x > -2$  on the number line.

[1 mark]

(Turn over)

6. In an experiment, a scientist records the temperature,  $y^{\circ}\text{C}$ , of an object as it is heated for  $X$  seconds.

The scientist thinks that the equation  $y = mx + c$  is a good fit for this data.

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

The diagram shows his results on a scatter graph and his line of best fit.

- (a) Estimate the number of seconds for which the object has been heated when its temperature is  $35^{\circ}\text{C}$

---

---

---

[1 mark]

continued on the next page . . .

(Turn over)

## Question 6 continued

6. (b) When  $x = 70$  seconds, the scientist measures the value of  $y$  to be  $52^{\circ}\text{C}$

Use this information to decide whether the line of best fit is likely or unlikely to give reliable predictions for values of  $y$  when  $x$  is greater than 50 seconds.

Likely ☐      Unlikely ☐

Explain how you decide.

---

---

---

---

---

[1 mark]

continued on the next page . . .

(Turn over)

### Question 6 continued

- 6. (c) The line of best fit passes through the points (0, 15) and (10, 22)**

**Find the equation of the line of best fit.**

**Give your answer in the form  $y = mx + c$**

[illegible]

---

---

[3 marks]

6. (d) Explain what the gradient of the line of best fit represents in this context.

---

---

---

---

---

---

[1 mark]

(Turn over)

- 7. Look at the diagram for Question 7 in the separate Diagram Booklet. The diagram is NOT drawn to scale.**

**$ABC$  is a right – angled triangle.**

**$AB = 4.8$  cm and angle  $BAC = 57^\circ$**

**Calculate the area of triangle  $ABC$ .**

[illegible]

---

---

---

---

---

---

---

Area = \_\_\_\_\_  $\text{cm}^2$

[5 marks]

8. Ask for the models for Question 8.  
The models are NOT made to scale.

A wedge is cut from a cylinder of cheese  
of radius **7 cm** and height **5 cm**.

The volume of this wedge is  **$154 \text{ cm}^3$**

What percentage of the whole cheese  
is this wedge?

---

---

---

---

---

---

---

---

---

---

---

---

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**[4 marks]**

9. Bronny takes part in a triathlon.

In this race she:

- swims **1.5 km** in  $\frac{3}{4}$  hour,
- cycles at an average speed of **27 km/h** for **1 hour and 30 minutes**,
- runs **9 km** in **1 hour**.

The average speed of the winner of the triathlon is **16.1 km/h**.

Show that Bronny does not win the race.

---

---

---

---

---

---

---

---

---

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**[4 marks]**

10. Look at the diagram for Question 10 in the separate Diagram Booklet.

David is trying archery for the first time.

He stands at  $A$  and tries to shoot an arrow at the target  $T$  but misses.

The arrow lands at a point  $X$  such that:

- $X$  is equidistant from  $S$  and  $R$ ,
- $XY$  is perpendicular to the path.

Construct accurately the position of  $X$  and measure by how many degrees David's shot is inaccurate.

You must use a ruler and a pair of compasses to construct suitable arcs and lines.

David's shot is inaccurate by \_\_\_\_\_°

[5 marks]

(Turn over)

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

**The diagram shows triangle  $ABC$  and triangle  $PQR$  on a coordinate grid.**

- (a) Describe the single transformation that maps triangle  $ABC$  to triangle  $PQR$ .**

---

---

---

**[2 marks]**

- (b) On the grid, draw the enlargement of triangle  $ABC$ , scale factor  $-1$ , centre  $(0, 3)$**

---

---

---

**[2 marks]**

**(Turn over)**

12. (a) Find the next term of the following sequence.

0, 7, 26, 63, 124, \_\_\_\_\_

---

---

---

---

---

---

---

[1 mark]

- (b) Find the  $n$ th term of the following sequence.

3, 9, 19, 33, 51, .....

---

---

---

---

(Turn over)

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**[2 marks]**

- 13. A cuboid of copper has a mass of 2150.4 grams and a volume of 240 cm<sup>3</sup>**

**A sphere of copper has a radius of  $X$  cm.**

**Show that the mass, in grams, of the sphere is less than  $38x^3$**

[illegible]

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**[4 marks]**

14. Simplify  $\frac{(5x^2y)^5}{y^6}$

[illegible]

**[3 marks]**

**(Turn over)**

15. (a) Jim squeezes **1** pink grapefruit.

He obtains **250 ml** of juice, **CORRECT TO THE NEAREST 50 ml**.

Jim thinks he will obtain a maximum of **900 ml** of juice if he squeezes **3** pink grapefruit.

Assuming each pink grapefruit is the same size, is Jim likely to be correct?

Yes ☐

No ☐

Show how you decide.

---

---

---

---

---

---

---

---

---

---

[2 marks]

**15. (b) The mass of a red grapefruit is 150 grams,  
CORRECT TO THE NEAREST 5 GRAMS.**

**The mass of a lemon is 85 grams,  
CORRECT TO THE NEAREST 5 GRAMS.**

**The total mass, CORRECT TO THE  
NEAREST 5 GRAMS, of this red grapefruit,  
lemon and an orange is 370 grams.**

**Calculate the minimum mass of the orange.**

---

---

---

---

---

---

---

**(Turn over)**

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**[3 marks]**

16. As part of an experiment two groups of people, **A** and **B**, took the same general knowledge test.

The test had a maximum of **100** marks.

- (a) Look at the table for Question 16 (a) in the separate Diagram Booklet.

The first two columns of the table summarise the results of the test for the **45** people in **GROUP A**.

- (i) Complete the cumulative frequency column.

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

[1 mark]

continued on the next page . . .

(Turn over)

**Question 16 (a) continued**

**16. (a) (ii) Explain why 60 is a reasonable estimate of the median mark.**

---

---

---

---

---

**[1 mark]**

**continued on the next page . . .**

**(Turn over)**

**Question 16 continued**

- 16. (b)** Look at the diagram for Question 16 (b) in the separate Diagram Booklet.

The diagram is a box plot.

The box plot shows the distribution of the marks of the people in **GROUP B**.

- (i)** For the people in **GROUP A**:

|                |    |
|----------------|----|
| Minimum mark   | 25 |
| Range          | 75 |
| Lower quartile | 45 |
| Median         | 60 |
| Upper quartile | 75 |

Draw the box plot for **GROUP A** on the grid.

---

---

---

**[3 marks]**

**(Turn over)**

**Question 16 (b) continued**

- 16. (b) (ii) Make TWO comments to compare the results of GROUP *A* and GROUP *B*.**

**One comment must include an appropriate average.**

**The other comment must include a measure of spread.**

**Comment 1** \_\_\_\_\_

---

---

---

---

---

**Comment 2** \_\_\_\_\_

---

---

---

---

**[2 marks]**

**(Turn over)**

17. On the grid provided for Question 17 in the separate Diagram Booklet, draw the region which satisfies all of these inequalities.

$$y \leq 5$$

$$y < 3 - 2x$$

$$y \geq x + 2$$

$$x \geq -2$$

Indicate clearly the region that is your answer.

---

---

---

---

---

---

---

---

---

---

---

---

---

**[4 marks]**

18. At a hotel, 70 guests completed a feedback survey.

The survey had 3 statements, *A*, *B* and *C*.  
Guests could tick 0, 1, 2 or all 3 of these statements.

Look at the diagram for Question 18  
in the separate Diagram Booklet.  
The diagram is a Venn diagram.

The Venn diagram shows the numbers of  
the 70 guests who ticked each statement.

- (a) One of these guests is chosen at random.  
Find the probability that this guest ticked  
statement *A* or statement *C* but not  
statement *B*.

---

---

---

---

---

---

[1 mark]

18. (b) Given that a guest ticked at least one statement, find the probability that this guest ticked statement *B*.

---

---

---

---

---

---

[2 marks]

(Turn over)

- 19. (a) Find the equation of the line parallel to  $4x = 5 - y$  which passes through the point  $(1, -1)$**

**Give your answer in the form  $y = mx + c$**

[illegible]

**[3 marks]**

**continued on the next page . . .**

**(Turn over)**

### Question 19 continued

- 19. (b) Find the equation of the line perpendicular to  $y = 1 - \frac{x}{5}$  which passes through the point  $(0, 7)$**

[illegible]

---

---

---

**[2 marks]**

20.  $R$  is proportional to  $P\left(1 - \frac{P}{100}\right)$

## When $P$ is 50, $R$ is 0.02

**(a) Find a formula for  $R$  in terms of  $P$ .**

[illegible]

---

---

[3 marks]

20. (b) Find the positive value of  $P$  for which  
 $R$  is 0

---

---

---

---

---

---

---

---

---

---

---

---

[2 marks]

(Turn over)

21. There are **8** seats in the front row of a theatre.  
**8** friends sit down in this row.

- (a) When each friend can sit in any of the  
**8** seats, find the number of different  
seating arrangements possible.

---

---

---

---

---

---

---

---

---

[2 marks]

continued on the next page . . .

(Turn over)

**Question 21 continued**

**21. (b) Liesa and Todd are 2 of the 8 friends.**

**Find the probability that Liesa is sitting  
in the first seat on the left and Todd is  
sitting next to her.**

---

---

---

---

---

---

---

---

---

---

**[3 marks]**

**(Turn over)**

22. A solution,  $X$ , of the equation  $x^3 + x - 1 = 0$  lies in the interval 'between 0.5 and 1'

Kate uses the method of interval bisection to find the solution correct to one decimal place.

(a) Show that Kate's second interval for  $X$  is 'between 0.5 and 0.75'

---

---

---

---

---

---

---

[2 marks]

continued on the next page . . .

(Turn over)

**Question 22 continued**

**22. (b) Complete Kate's third interval for  $X$ ,**

**'between \_\_\_\_\_ and 0.75'**

---

---

---

---

---

**[1 mark]**

**continued on the next page . . .**

**(Turn over)**

### Question 22 continued

**22. (c) Continue Kate's method of interval bisection to show that the solution is  $x = 0.7$  correct to one decimal place.**

[illegible]

**[2 marks]**

**(Turn over)**

**23. Debra buys a total of 4 kg of flour and butter at a market.**

**She pays £7 for her flour and £9 for her butter.**

**She buys  $x$  kg of flour.**

**(a) Look at the table for Question 23 (a) in the separate Diagram Booklet.**

**Complete the table.**

**[1 mark]**

**continued on the next page . . .**

### Question 23 continued

- 23. (b) The cost per kilogram of her butter is £5 more than the cost per kilogram of her flour.**

**Use this information and the table in part (a) to show that**

$$5x^2 - 4x - 28 = 0$$

[illegible]

**(Turn over)**

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**[5 marks]**

**continued on the next page . . .**

**(Turn over)**

### Question 23 continued

- 23. (c) Use an algebraic method to find the cost of a kilogram of her flour. You must show all your working.**

[illegible]

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |

**[4 marks]**

24. Look at the diagram for Question 24 in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

Angle  $ABC$  is acute.

The area of triangle  $ABC$  is  $45.0 \text{ cm}^2$

Show that angle  $ABC = 50^\circ$  correct to the nearest integer and hence calculate angle  $ADC$ .

---

---

---

---

---

---

---

---

---

---

---

**TOTAL 120 MARKS**

---

| <b>Question number</b> | <b>Additional pages, if required. Write the question number(s) in the left - hand margin.</b> |
|------------------------|-----------------------------------------------------------------------------------------------|
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |
|                        |                                                                                               |

| <b>Question<br/>number</b> | <b>Additional pages, if required. Write the<br/>question number(s) in the left - hand margin.</b> |
|----------------------------|---------------------------------------------------------------------------------------------------|
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |
|                            |                                                                                                   |

| Question number | Additional pages, if required. Write the question number(s) in the left - hand margin. |
|-----------------|----------------------------------------------------------------------------------------|
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |
|                 |                                                                                        |

**C300UB0-1**

**TUESDAY, 7 JUNE 2022 – MORNING**

**MATHEMATICS – COMPONENT 2**

**CALCULATOR – ALLOWED MATHEMATICS**

**HIGHER TIER**

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

# **Diagram Booklet**

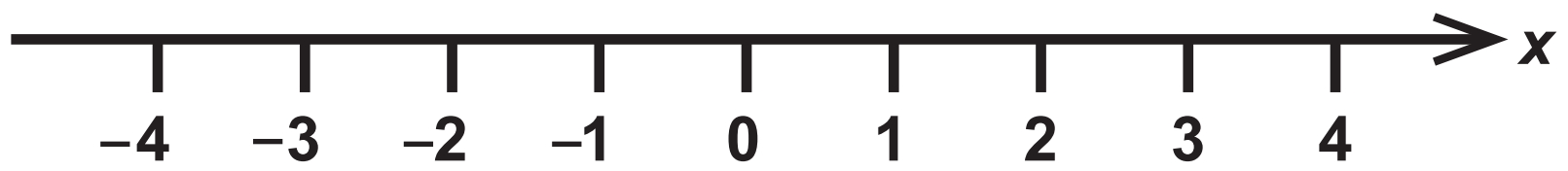
**Surname:** \_\_\_\_\_

**First name(s):** \_\_\_\_\_

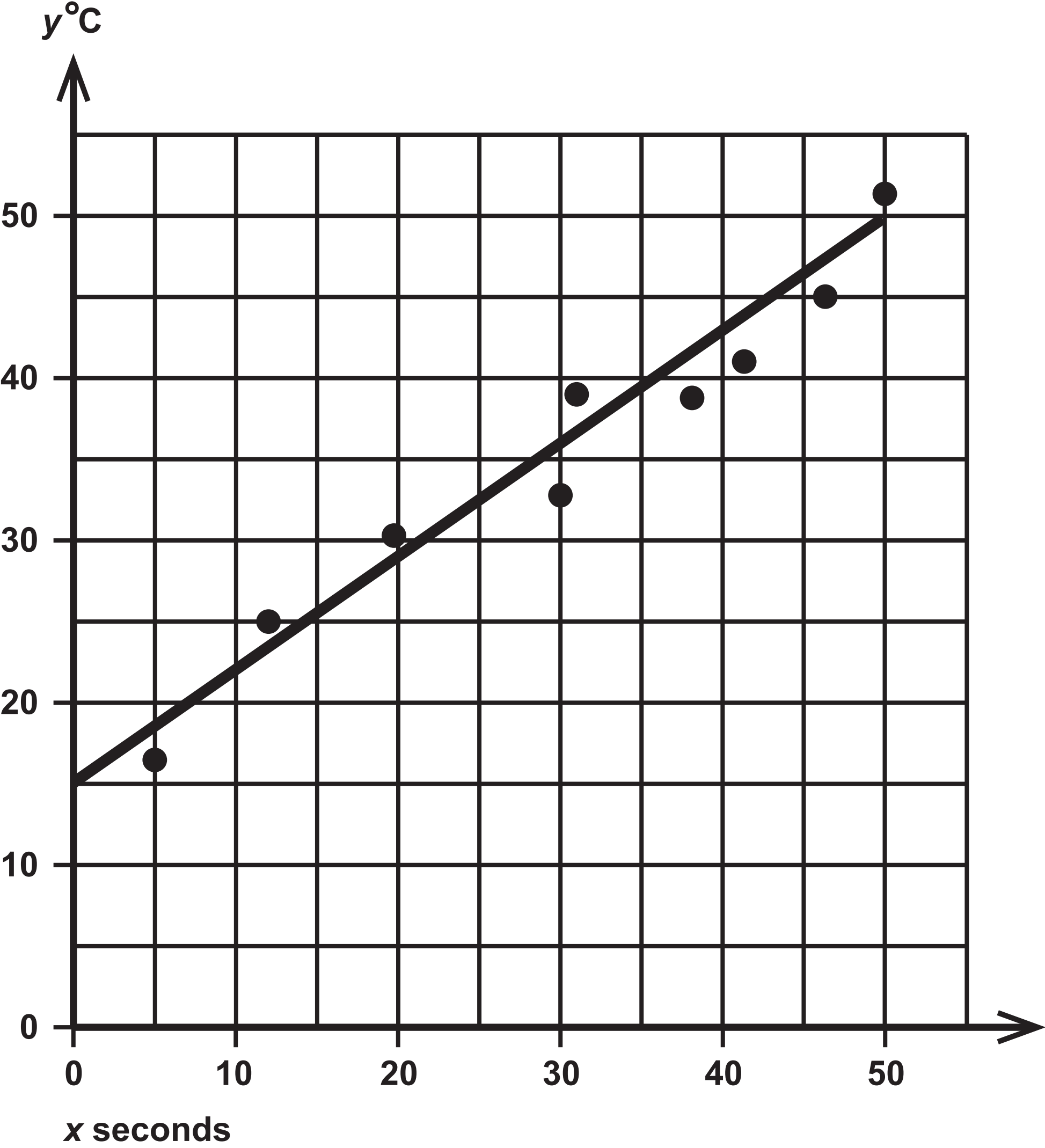
**Centre Number:** \_\_\_\_\_

**Candidate Number:** 0 \_\_\_\_\_

### Question 5 (d)

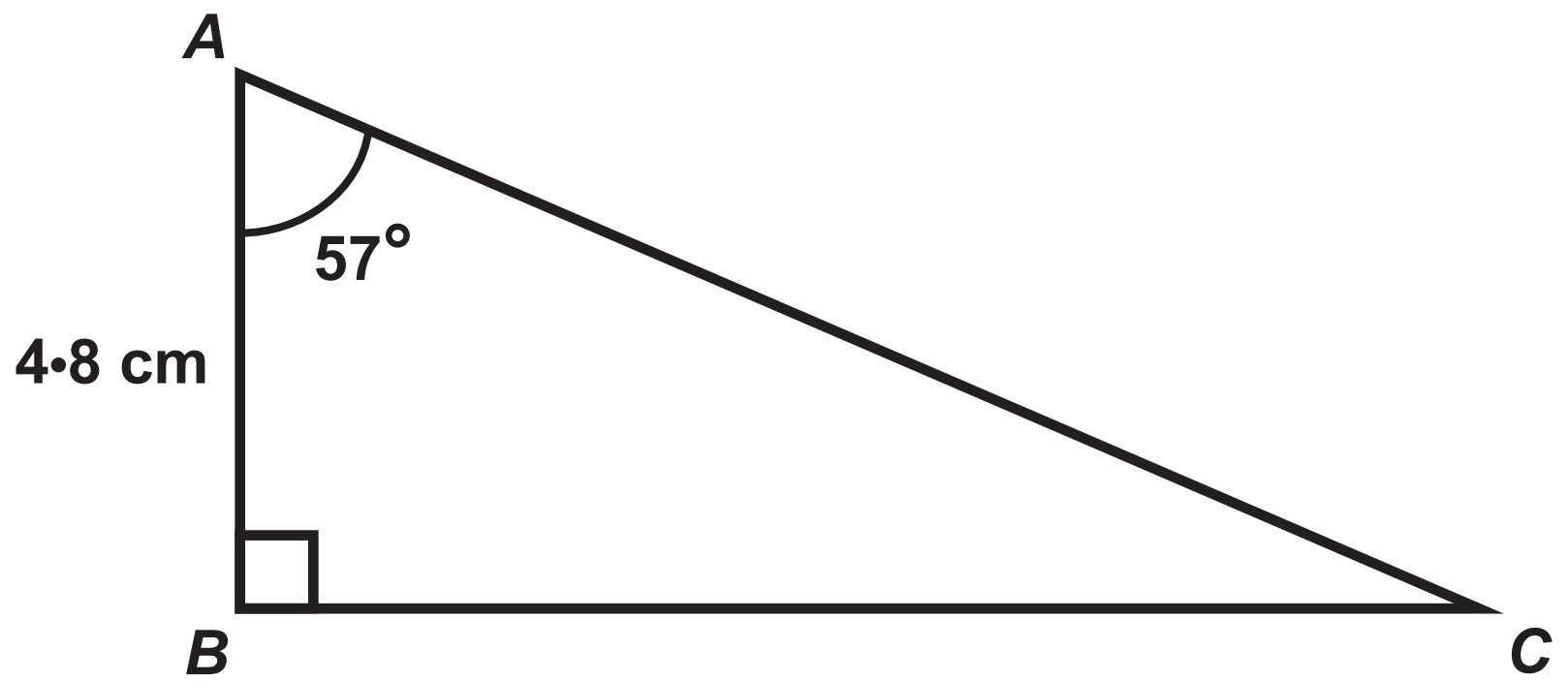


Question 6

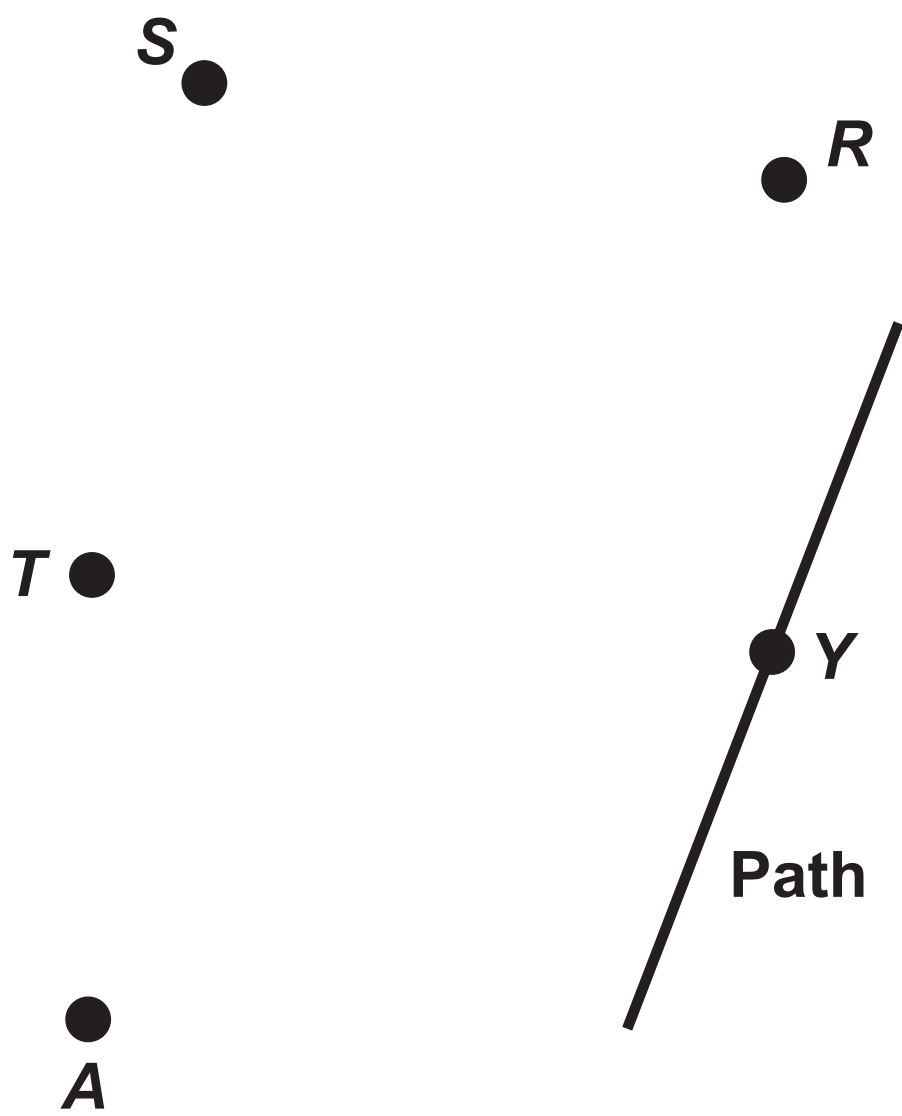


### Question 7

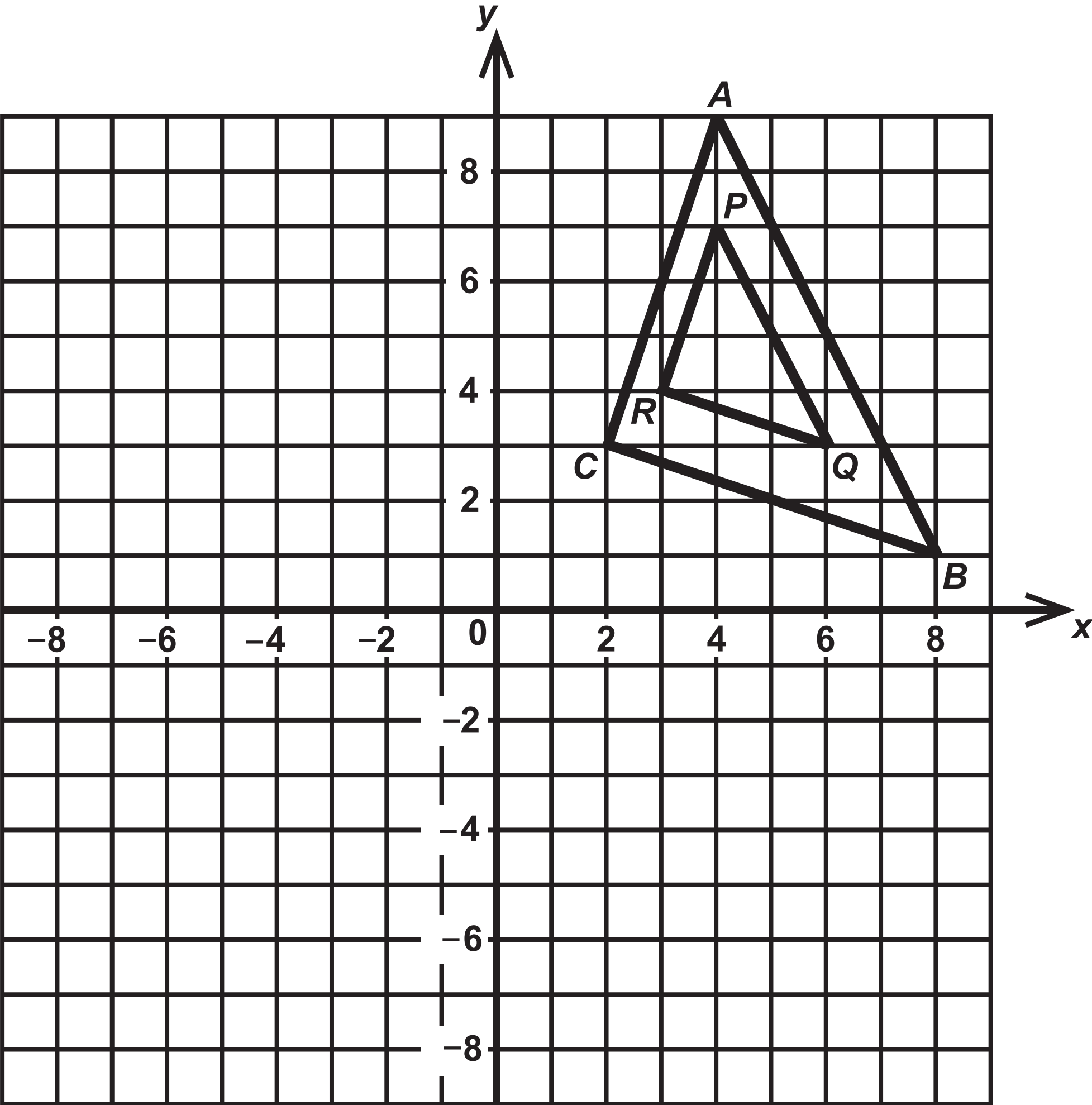
Diagram NOT drawn to scale



Question 10



Question 11

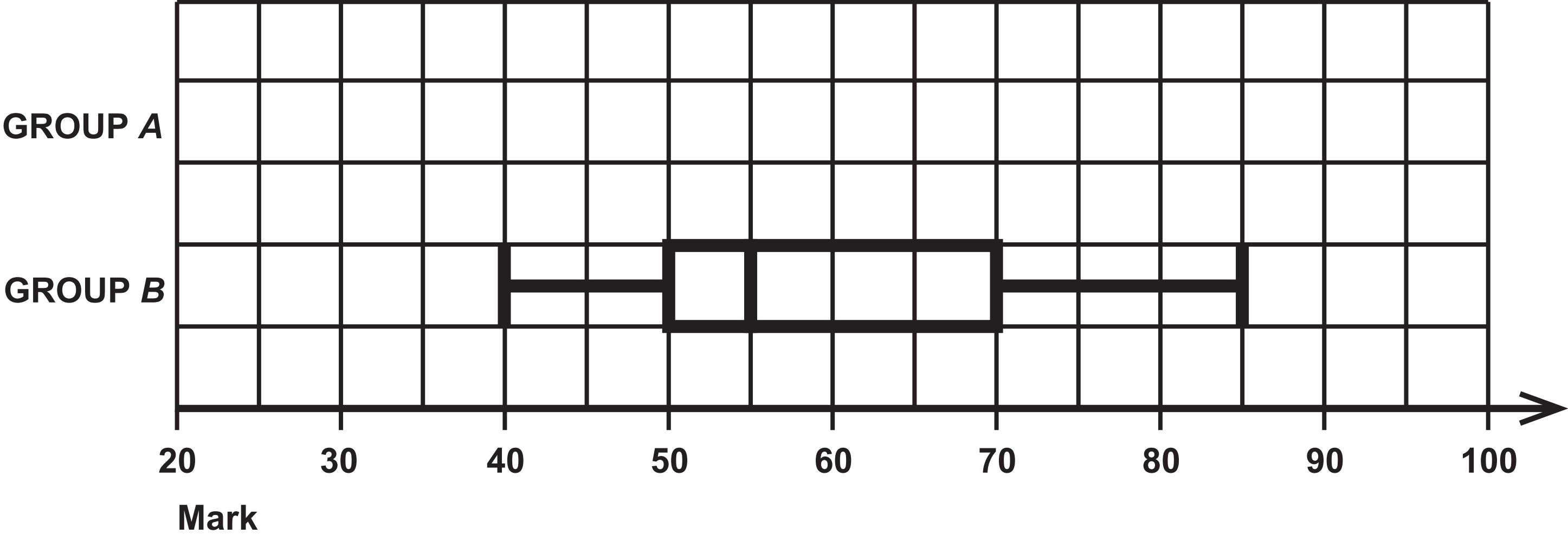


### Question 16 (a)

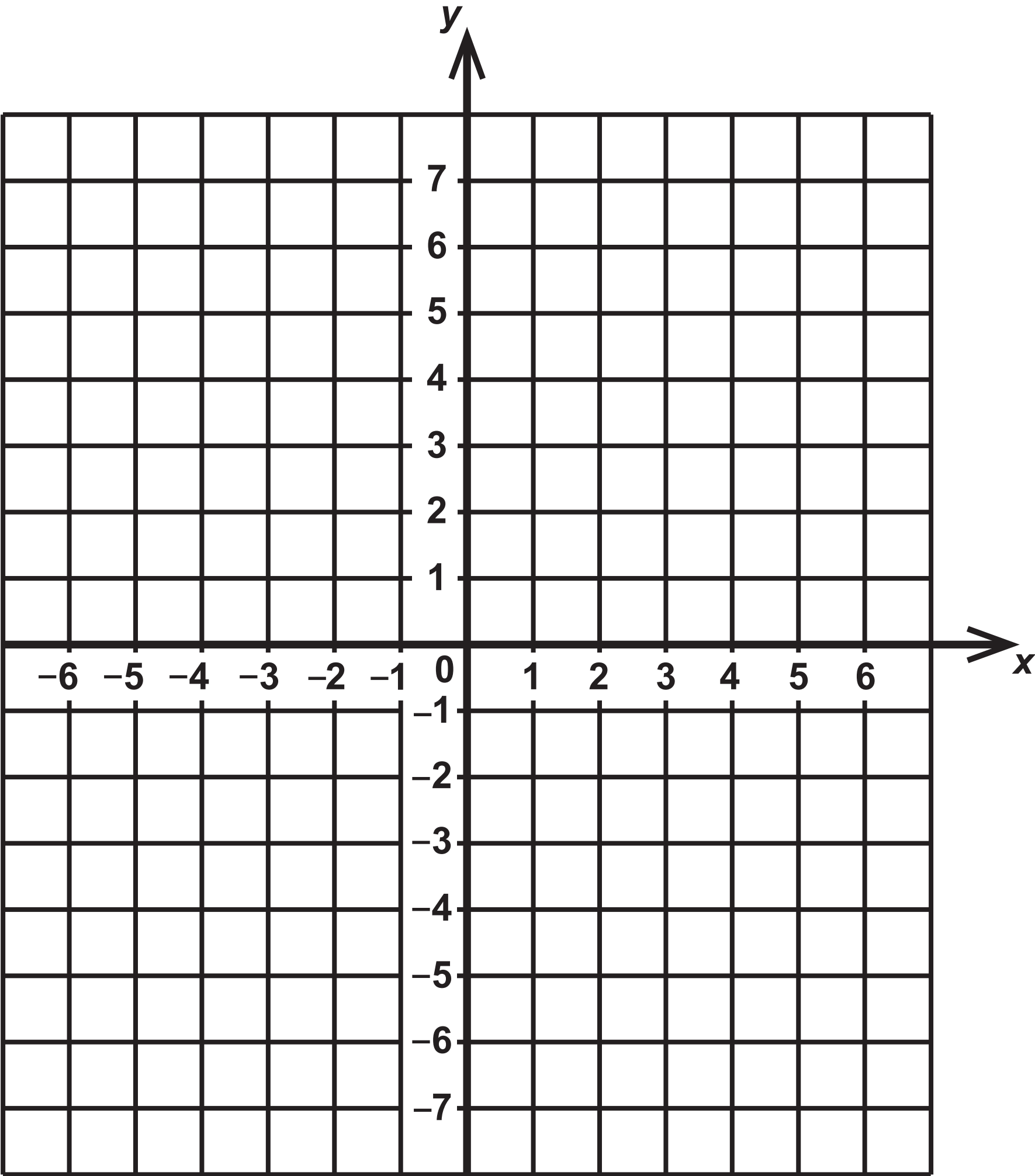
Table

| Mark              | Frequency | Cumulative Frequency |
|-------------------|-----------|----------------------|
| $0 < p \leq 20$   | 0         | 0                    |
| $20 < p \leq 40$  | 7         | 7                    |
| $40 < p \leq 60$  | 16        |                      |
| $60 < p \leq 80$  | 15        |                      |
| $80 < p \leq 100$ | 7         |                      |

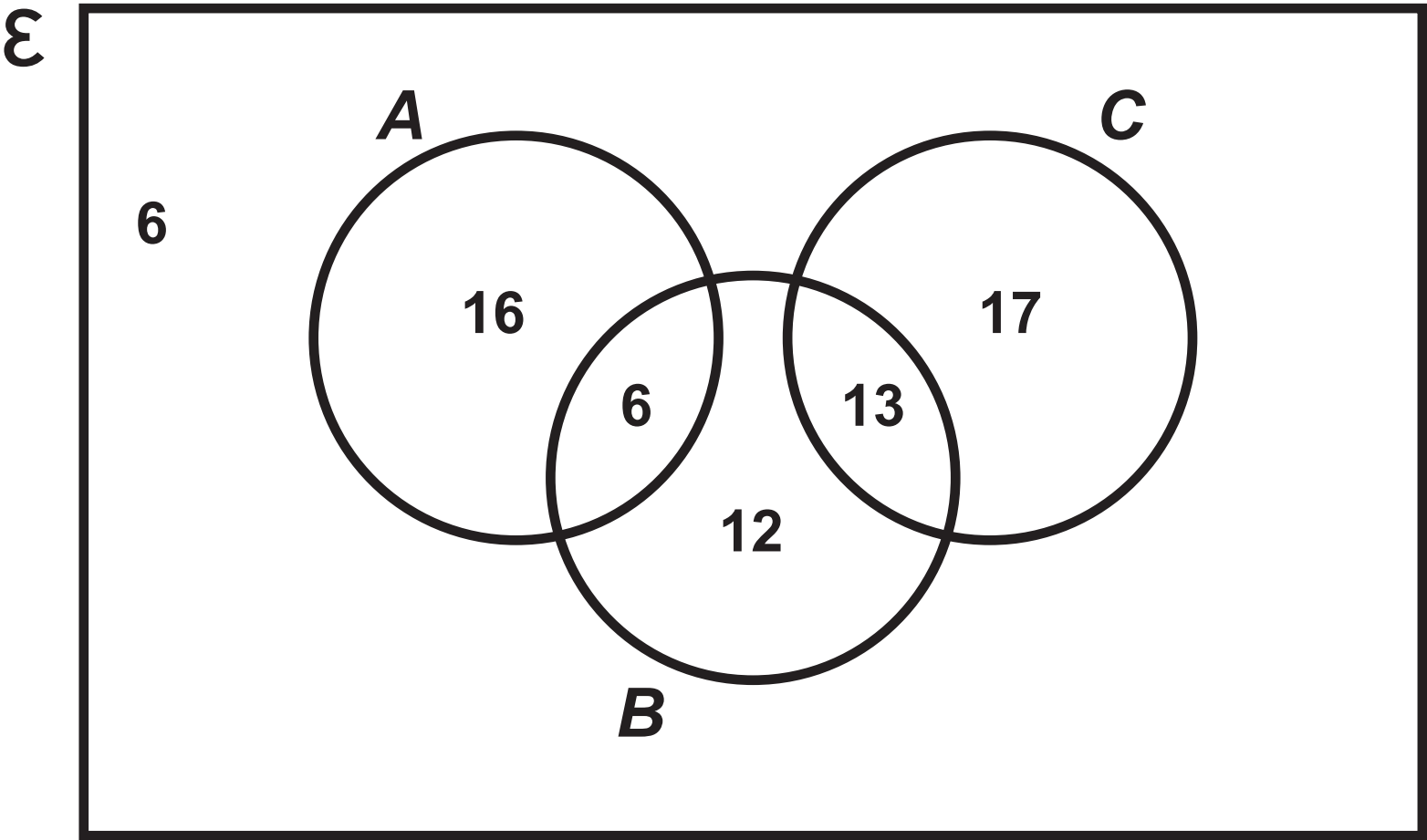
Question 16 (b)



Question 17



Question 18



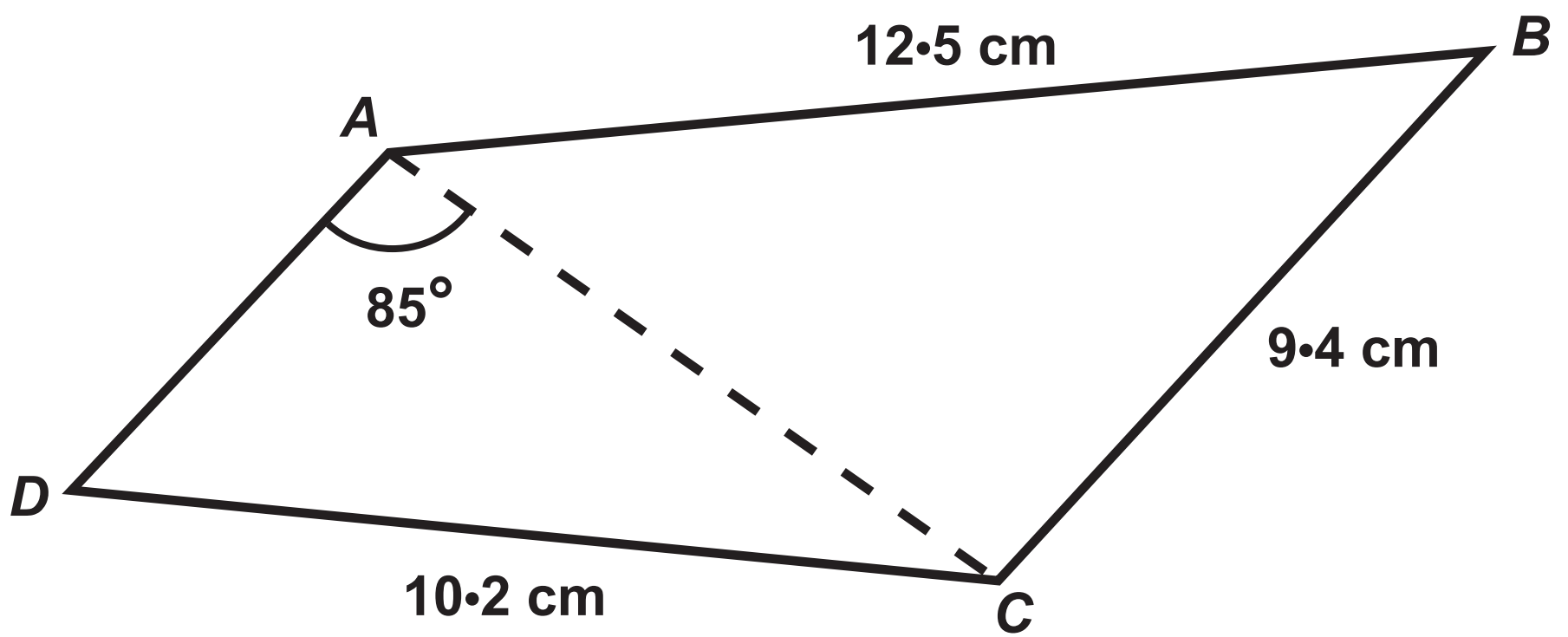
Question 23 (a)

Table

|                     | Flour         | Butter  |
|---------------------|---------------|---------|
| Total cost (£)      | 7             | 9       |
| Number of kg bought | $x$           | $4 - x$ |
| Cost per kg (£)     | $\frac{7}{x}$ |         |

### Question 24

Diagram NOT drawn to scale



**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:

$$v = u + at$$

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

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

**C300UB0-1A**

**TUESDAY, 7 JUNE 2022 – MORNING**

**MATHEMATICS**

**HIGHER 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:**

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

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

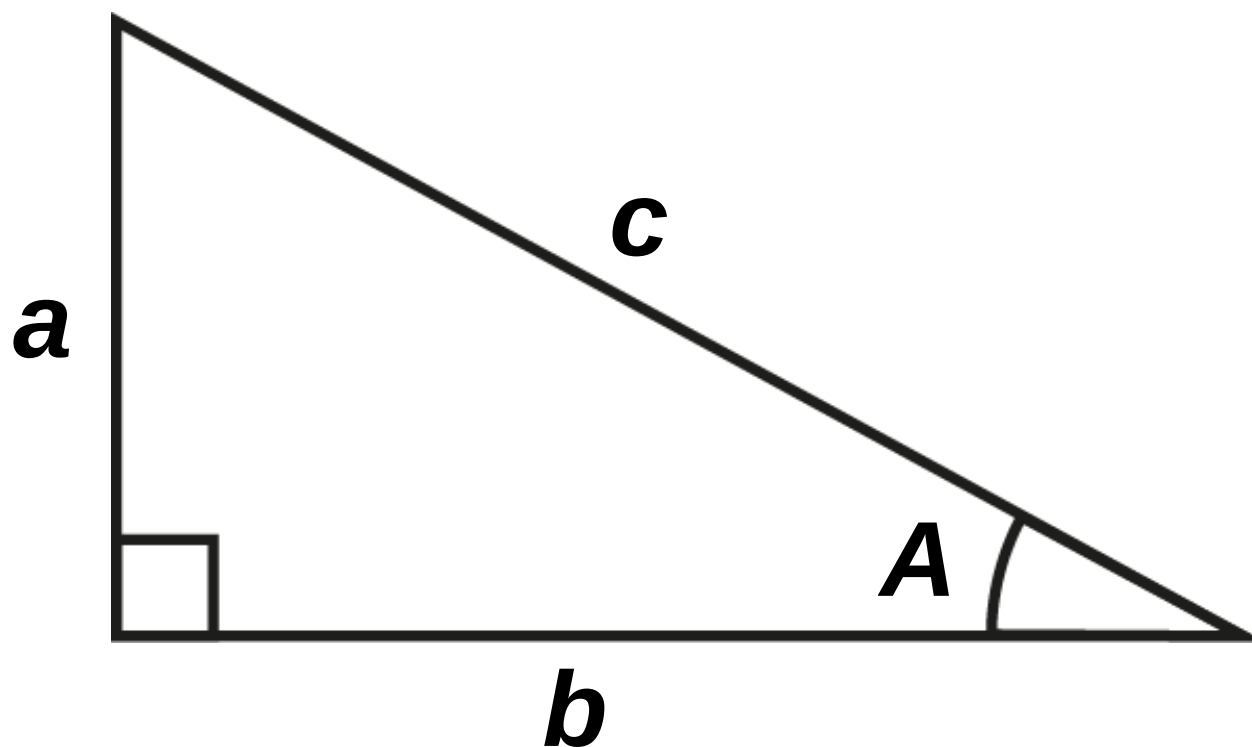
# QUADRATIC FORMULA

The solutions of  $ax^2 + bx + c = 0$

where  $a \neq 0$ :

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

# PYTHAGORAS' THEOREM AND TRIGONOMETRY

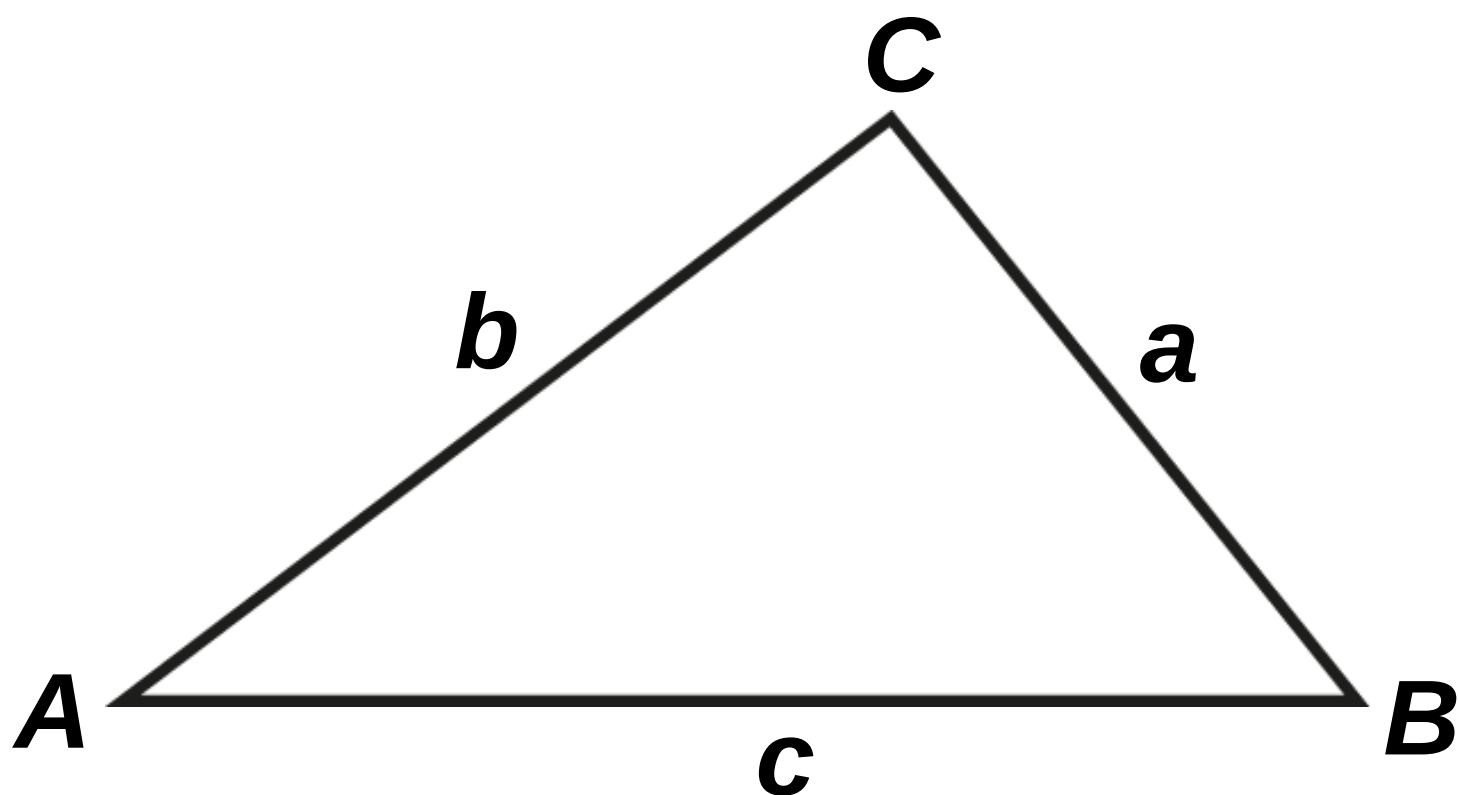


In any right – angled triangle where  $a$ ,  $b$  and  $c$  are the length of the sides and  $c$  is the hypotenuse:

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

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

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



In any triangle **ABC** where **a**, **b** and **c** are the length of the sides:

sine rule:  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

cosine rule:

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area of a triangle} = \frac{1}{2}ab \sin C$$

## 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  $B$ :

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

$$P(A \text{ and } B) = P(A \text{ given } B) P(B)$$