

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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## Pearson Edexcel International GCSE (9-1)

**Wednesday 4 June 2025**

Morning (Time: 2 hours)

Paper  
reference

**4WM2H/01**

### Mathematics A (Modular)

UNIT 2H

Higher Tier



**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- **Calculators may be used.**
- You must **NOT** write anything on the formulae page.  
Anything you write on the formulae page will gain NO credit.

### Information

- The total mark for this unit is 100.
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

### Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Turn over ►

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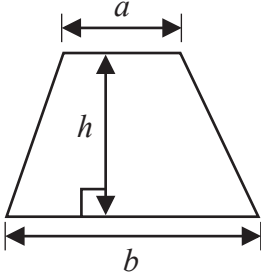
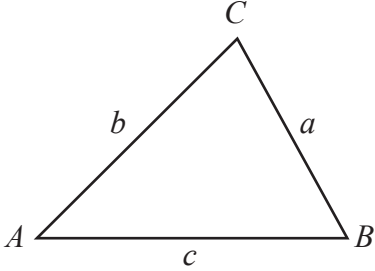
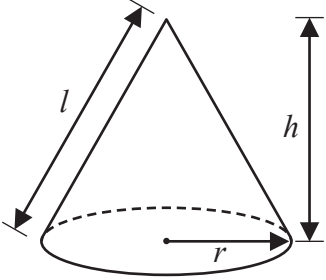
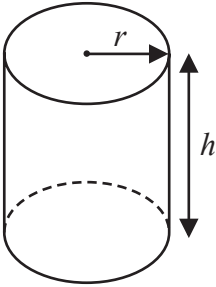
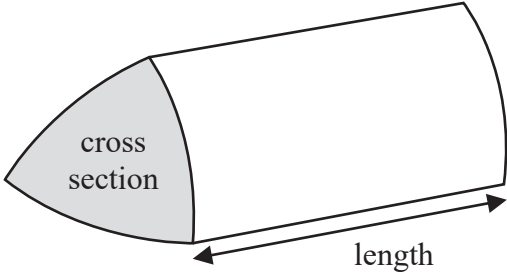
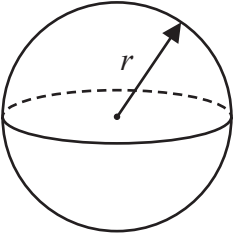
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International GCSE Mathematics

Formulae sheet – Higher Tier

<p><b>Arithmetic series</b> Sum to <math>n</math> terms, <math>S_n = \frac{n}{2} [2a + (n - 1)d]</math></p>	<p>Area of trapezium = <math>\frac{1}{2}(a + b)h</math></p> 
<p><b>The quadratic equation</b> The solutions of <math>ax^2 + bx + c = 0</math> where <math>a \neq 0</math> are given by: <math display="block">x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}</math></p>	<p><b>In any triangle <math>ABC</math></b> <b>Sine Rule</b> <math>\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}</math> <b>Cosine Rule</b> <math>a^2 = b^2 + c^2 - 2bc \cos A</math> <b>Area of triangle</b> = <math>\frac{1}{2}ab \sin C</math></p>
<p><b>Trigonometry</b></p> 	<p><b>Volume of cone</b> = <math>\frac{1}{3}\pi r^2 h</math> <b>Curved surface area of cone</b> = <math>\pi r l</math></p> 
<p><b>Volume of cylinder</b> = <math>\pi r^2 h</math> <b>Curved surface area of cylinder</b> = <math>2\pi r h</math></p> 	<p><b>Volume of prism</b> = area of cross section <math>\times</math> length</p> 
<p><b>Volume of sphere</b> = <math>\frac{4}{3}\pi r^3</math> <b>Surface area of sphere</b> = <math>4\pi r^2</math></p> 	

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Answer ALL TWENTY SEVEN questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Rio has six cards.  
He writes a number on each card so that

the range of the numbers is 10  
the median of the numbers is 7.5  
the mode of the numbers is 6

Rio arranges the cards so that the numbers are in order of size.

		6		10	14
--	--	---	--	----	----

Three of the numbers are hidden.

Complete the cards above to show the three numbers that are hidden.

(Total for Question 1 is 3 marks)



P 8 1 6 4 1 A 0 3 3 2

2 The diagram shows a solid prism with a cross section in the shape of a trapezium.

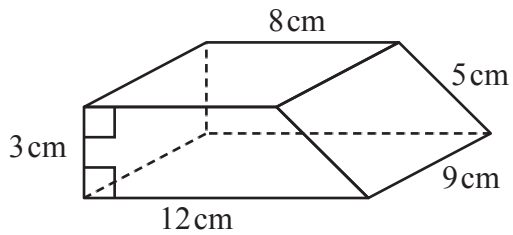


Diagram **NOT** accurately drawn

Work out the total surface area of the prism.

..... cm<sup>2</sup>

(Total for Question 2 is 3 marks)

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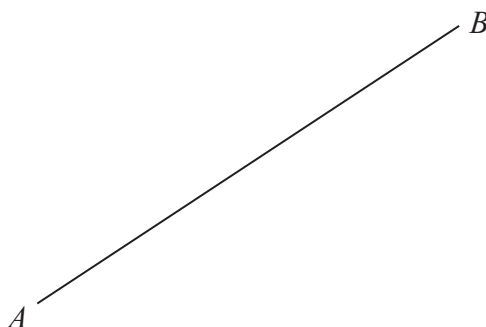
- 3 Bernice bought a car for \$8000  
She sold the car for \$5600

Work out Bernice's percentage loss when she sold the car.

..... %

**(Total for Question 3 is 3 marks)**

- 4 Using ruler and compasses only, construct the perpendicular bisector of the line  $AB$   
Show all your construction lines.



**(Total for Question 4 is 2 marks)**



5 Here are the first five terms of a number sequence.

11    15    19    23    27

(a) Find an expression in terms of  $n$  for the  $n$ th term of this sequence.

.....  
(2)

The  $n$ th term of another number sequence is  $5n + 4$

Salim says no term in this sequence is a prime number.

(b) Find a term in this sequence that shows Salim is wrong.

.....  
(1)

**(Total for Question 5 is 3 marks)**



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6 The diagram shows two similar quadrilaterals,  $ABCD$  and  $EFGH$

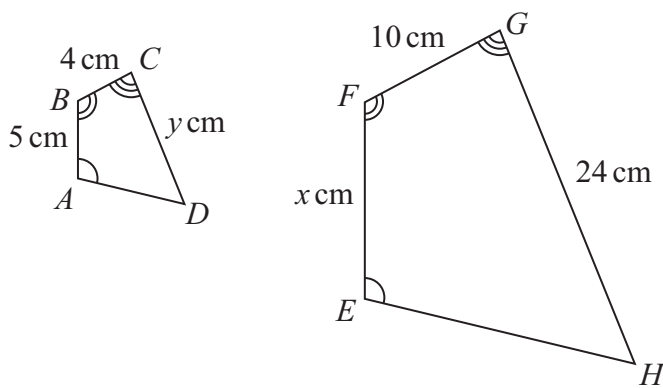


Diagram **NOT** accurately drawn

$$AB = 5 \text{ cm} \quad BC = 4 \text{ cm} \quad CD = y \text{ cm}$$

$$EF = x \text{ cm} \quad FG = 10 \text{ cm} \quad GH = 24 \text{ cm}$$

(a) Work out the value of  $x$

$$x = \dots\dots\dots (2)$$

(b) Work out the value of  $y$

$$y = \dots\dots\dots (2)$$

(Total for Question 6 is 4 marks)



P 8 1 6 4 1 A 0 7 3 2

7 Pau, Sam and Tia share £240 in the ratios 3 : 4 : 5

Sam and Tia each give £10 of their share to Pau.

Work out the ratios of the amounts of money that Pau, Sam and Tia now have.  
Give your answer in its simplest form.

..... : ..... : .....

**(Total for Question 7 is 4 marks)**

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- 8 The table gives information about the lengths of time, in minutes, that some people were in a coffee shop.

Length of time ( $m$ minutes)	Frequency
$0 < m \leq 10$	$x$
$10 < m \leq 20$	3
$20 < m \leq 30$	2
$30 < m \leq 40$	4
$40 < m \leq 50$	2

The information in the table is used to calculate an estimate for the mean length of time these people were in the coffee shop.

The estimate for the mean length of time is 20

Work out the value of  $x$

$x = \dots\dots\dots$

(Total for Question 8 is 4 marks)



- 9 Tim buys a bracelet for 4000 Swiss francs.  
The value of the bracelet increases by 7% each year.

Work out the value of the bracelet at the end of 3 years.  
Give your answer correct to the nearest Swiss franc.

..... Swiss francs

**(Total for Question 9 is 3 marks)**

- 10 Solve the simultaneous equations

$$\begin{aligned}3x + 5y &= 8 \\4x + y &= -3.5\end{aligned}$$

Show clear algebraic working.

$x = \dots\dots\dots$

$y = \dots\dots\dots$

**(Total for Question 10 is 3 marks)**



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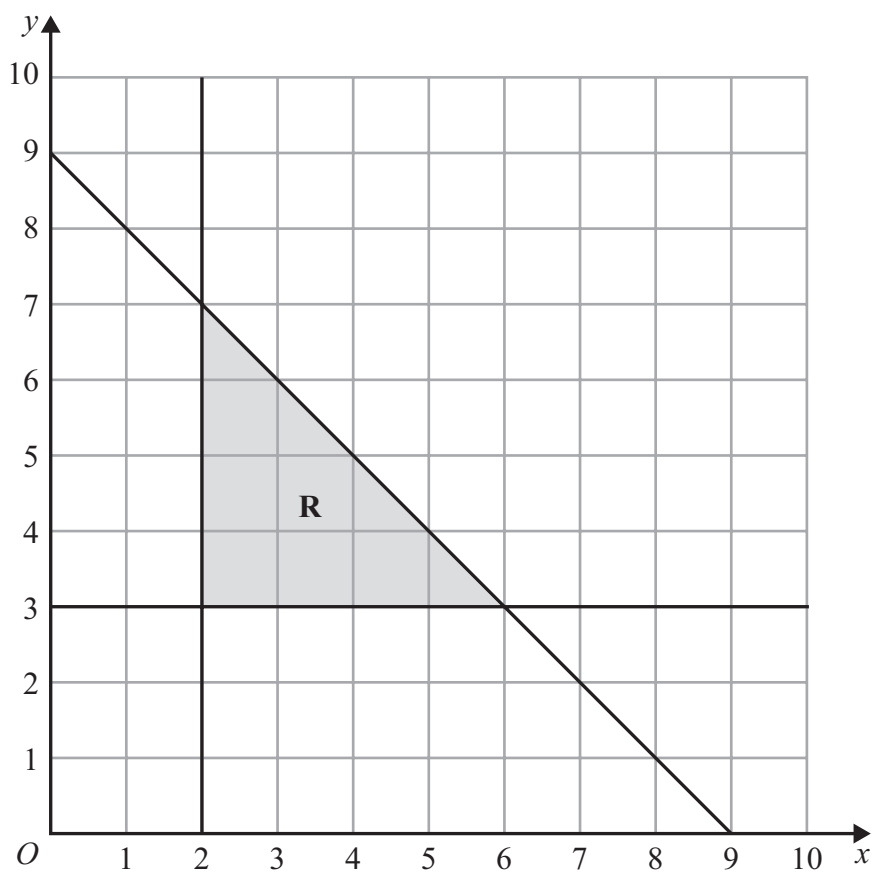
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11 (a) Solve the inequality  $7 - 3t < 2t + 15$

.....  
(2)

The region **R**, shown shaded in the diagram, is bounded by three straight lines.



(b) Write down three inequalities that define the region **R**

.....  
.....  
.....  
(3)

(Total for Question 11 is 5 marks)



12 (a) Write  $8.6 \times 10^{-5}$  as an ordinary number.

.....  
(1)

(b) Work out  $(3 \times 10^{143}) \div (6 \times 10^{137})$

Give your answer in standard form.

.....  
(2)

**(Total for Question 12 is 3 marks)**

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13 The diagram shows a circle, centre  $O$

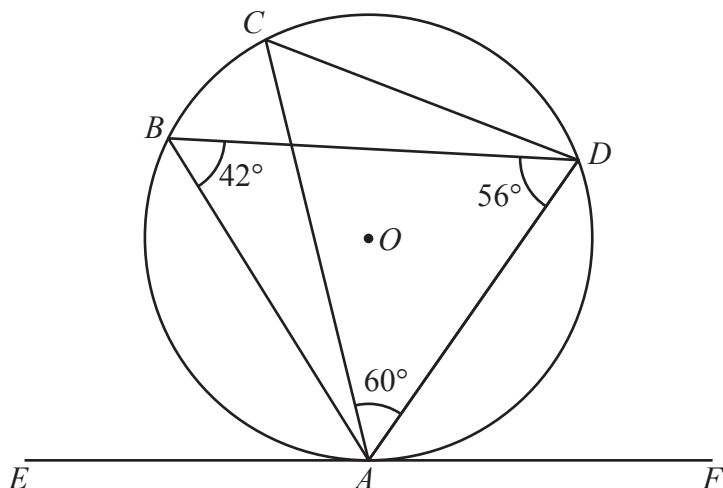


Diagram **NOT** accurately drawn

$A, B, C$  and  $D$  are points on the circle.  
 $EAF$  is the tangent to the circle at  $A$

angle  $ABD = 42^\circ$

angle  $BDA = 56^\circ$

angle  $CAD = 60^\circ$

(a) (i) Find the size of angle  $EAB$

.....  
(1)

(ii) Give a reason for your answer to (a) (i)

.....  
.....  
(1)

(b) Work out the size of angle  $CDB$

.....  
(2)

(Total for Question 13 is 4 marks)



P 8 1 6 4 1 A 0 1 3 3 2

- 14 The frequency table gives information about the times, in minutes, that 60 people took to complete a puzzle.

Time ( $t$ minutes)	Frequency
$0 < t \leq 10$	8
$10 < t \leq 20$	13
$20 < t \leq 30$	12
$30 < t \leq 40$	17
$40 < t \leq 50$	7
$50 < t \leq 60$	3

- (a) Complete the cumulative frequency table.

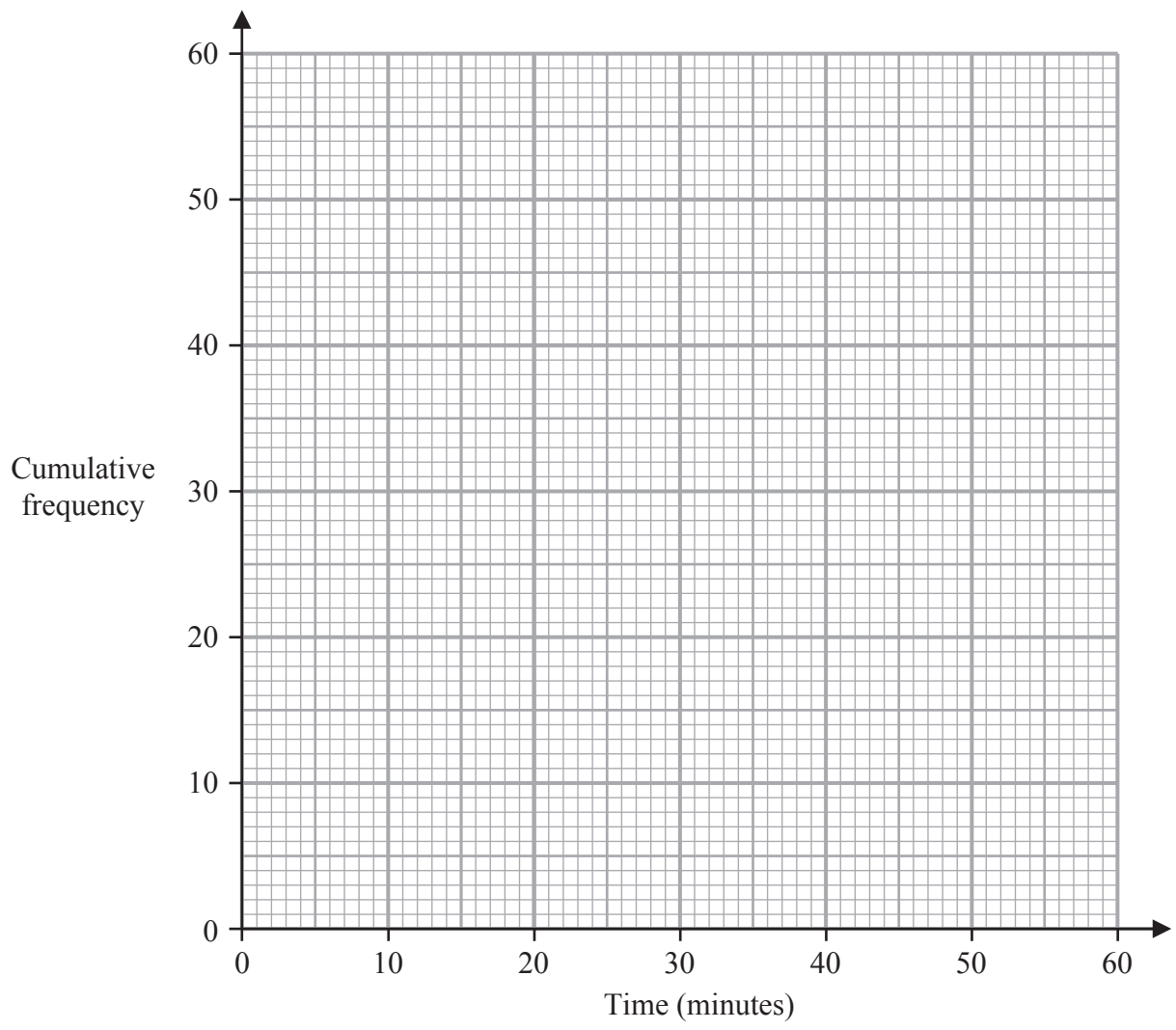
Time ( $t$ minutes)	Cumulative frequency
$0 < t \leq 10$	
$0 < t \leq 20$	
$0 < t \leq 30$	
$0 < t \leq 40$	
$0 < t \leq 50$	
$0 < t \leq 60$	

(1)

- (b) On the grid opposite, draw a cumulative frequency graph for your table.



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(2)

(c) Use your graph to find an estimate for the median time.

..... minutes  
(1)

(d) Use your graph to find an estimate for the number of these people who took more than 45 minutes to complete the puzzle.

.....  
(2)

(Total for Question 14 is 6 marks)



15 Fred buys a painting.

The value of the painting increases by 12% during the first year.

The value of the painting then decreases by 15% during the second year.

Work out the overall percentage decrease in the value of the painting during this two-year period.

..... %

(Total for Question 15 is 3 marks)

16 Here are the numbers of goals scored by a netball team in its 11 games this season.

7    8    10    11    13    14    16    17    19    21    24

Work out the interquartile range for the number of goals.

.....

(Total for Question 16 is 2 marks)



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17  $A = 3^2 \times 5^4$       $B = 2^5 \times 3^2$       $C = 2^3 \times 5^6$

(a) Work out the value of  $(ABC)^3$

Give your answer as a product of powers of its prime factors.

.....  
(2)

(b) Work out  $(5 \times 10^{150}) \times (3 \times 10^{140})$

Give your answer as a product of powers of its prime factors.

.....  
(2)

(Total for Question 17 is 4 marks)



18  $W$  is inversely proportional to  $y^2$

$$W = 50 \text{ when } y = 4$$

Find a formula for  $W$  in terms of  $y$

.....  
(Total for Question 18 is 3 marks)

19 Make  $t$  the subject of the formula  $c = \frac{t^2 + 3}{7 - 8t^2}$

.....  
(Total for Question 19 is 4 marks)

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20  $a$ ,  $b$  and  $c$  are three consecutive even numbers where  $a < b < c$

Prove algebraically that  $b^2 = ac + 4$

(Total for Question 20 is 3 marks)



21 The function  $g$  is defined as

$$g(x) = \frac{7x + 20}{2x} \quad x \neq 0$$

- (a) Solve  $gg(x) = 6$   
Show clear algebraic working.

$x =$  .....  
(3)

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The function  $h$  is defined as

$$h(x) = 5x^2 + 30x - 7 \quad x \geq -3$$

(b) Express the inverse function  $h^{-1}$  in the form  $h^{-1}(x) = \dots$

$$h^{-1}(x) = \dots \dots \dots \quad (4)$$

**(Total for Question 21 is 7 marks)**



- 22 Work out the range of values of  $x$  for which the graph of  $y = x^3 + \frac{13}{2}x^2 - 10x + 5$  has a positive gradient.  
Show clear algebraic working.

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.....  
(Total for Question 22 is 4 marks)



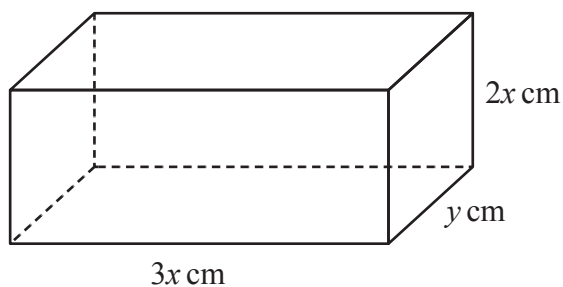
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23 The diagram shows a cuboid.

Diagram **NOT**  
accurately drawn



The cuboid measures  $3x$  cm by  $2x$  cm by  $y$  cm

The volume of the cuboid is  $1014 \text{ cm}^3$

The total surface area of the cuboid is  $A \text{ cm}^2$

Show that  $A = 12x^2 + \frac{1690}{x}$

You must show all the stages of your working.

(Total for Question 23 is 3 marks)



P 8 1 6 4 1 A 0 2 3 3 2

- 24 The 21st term of an arithmetic series is 109  
The sum of the first 52 terms of the series is 4381

Work out the 5th term of the series.  
Show clear algebraic working.

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.....  
(Total for Question 24 is 4 marks)



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25 **A** and **B** are two similar solids.

The height of solid **A** is 31 cm

The height of solid **B** is 18.6 cm

Given that

$$\text{volume of solid A} - \text{volume of solid B} = 735 \text{ cm}^3$$

find the volume of solid **A**

..... cm<sup>3</sup>

(Total for Question 25 is 4 marks)



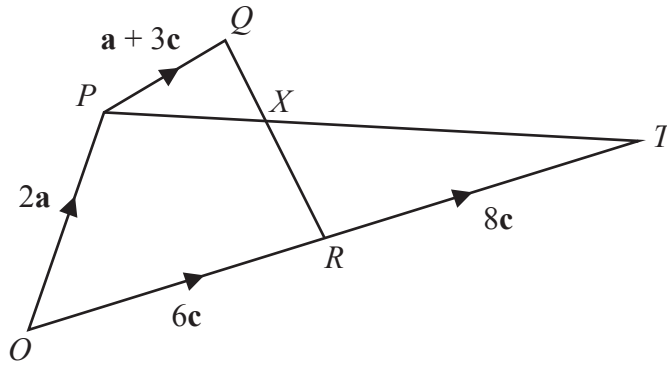


Diagram NOT accurately drawn

The diagram shows a quadrilateral  $OPQR$  in which

$$\vec{OP} = 2\mathbf{a} \quad \vec{OR} = 6\mathbf{c} \quad \vec{PQ} = \mathbf{a} + 3\mathbf{c}$$

- (a) Find  $\vec{QR}$  in terms of  $\mathbf{a}$  and  $\mathbf{c}$

$$\vec{QR} = \dots\dots\dots (1)$$

The point  $T$  is such that  $\vec{RT} = 8\mathbf{c}$   
 The point  $X$  lies on  $QR$  such that  $PXT$  is a straight line.

- (b) Using a vector method, find the ratio  $QX:XR$   
 Give your answer in the form  $m:n$  where  $m$  and  $n$  are integers.  
 Show your working clearly.

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$$QX:XR = \dots\dots\dots (4)$$

(Total for Question 26 is 5 marks)



27 A curve has equation  $y = f(x)$

There is one maximum point on this curve.

The coordinates of this maximum point are  $(6, -5)$

(a) Write down the coordinates of the maximum point on the curve with equation

(i)  $y = f(x - 4)$

(....., .....)  
(1)

(ii)  $y = f(3x)$

(....., .....)  
(1)

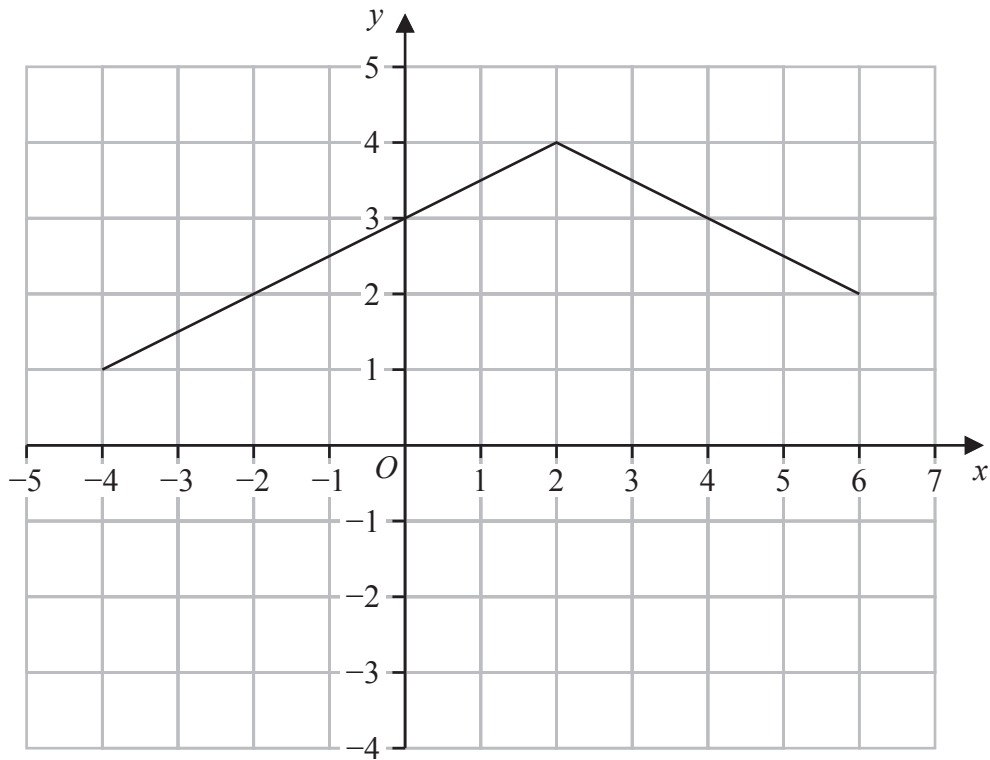


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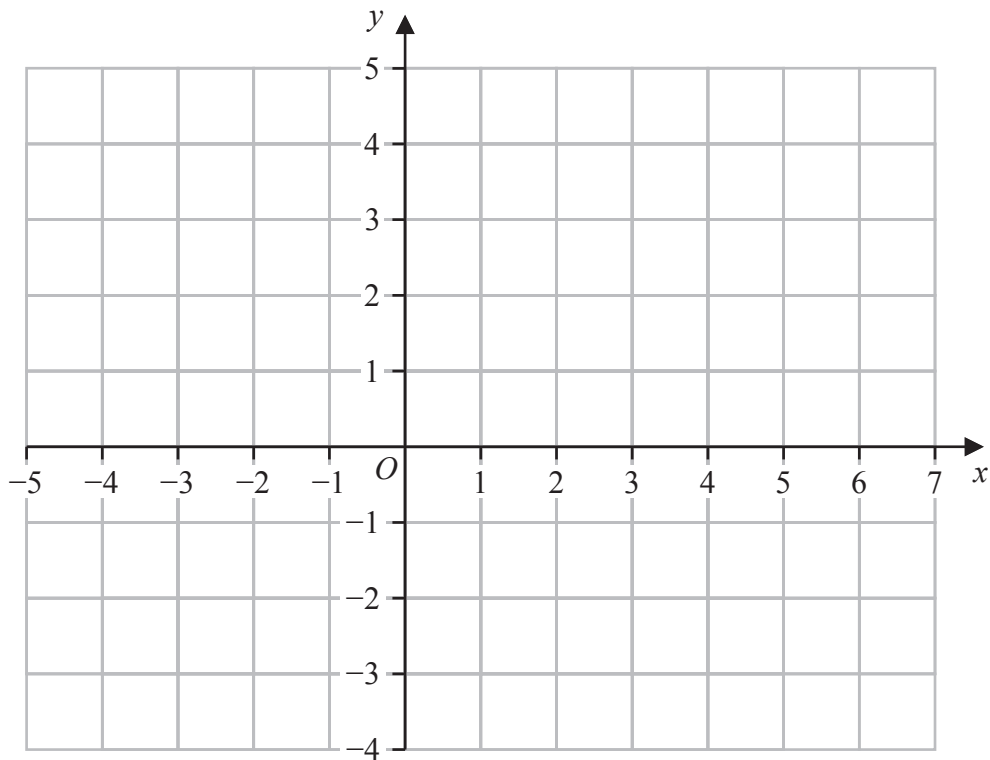
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Here is the graph of  $y = g(x)$



(b) On the grid below, draw the graph of  $y = g(2x) - 3$



(2)

(Total for Question 27 is 4 marks)

TOTAL FOR UNIT IS 100 MARKS



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