Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

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 ▶

©2025 Pearson Education Ltd.

International GCSE Mathematics

Formulae sheet – Higher Tier

Arithmetic series

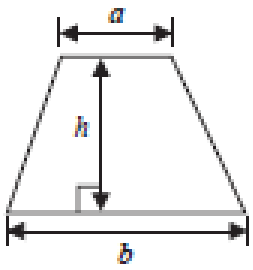
Sum to n terms, $S_n = \frac{n}{2}[2a + (n-1)d]$

The quadratic equation

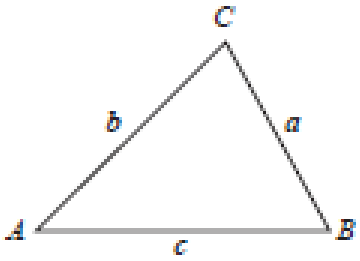
The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by:

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

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



Trigonometry



In any triangle ABC

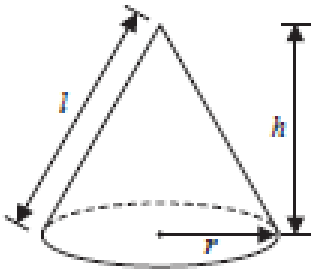
Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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

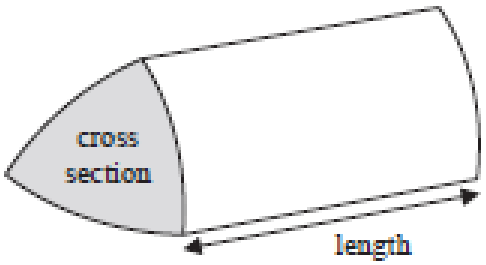
Area of triangle $= \frac{1}{2}ab\sin C$

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

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

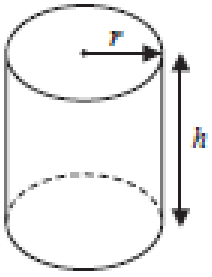


Volume of prism
= area of cross section × length



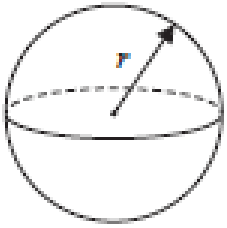
Volume of cylinder $= \pi r^2 h$

Curved surface area of cylinder $= 2\pi r h$



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

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



©2025 Pearson Education Ltd.

Answer ALL TWENTY SEVEN questions.

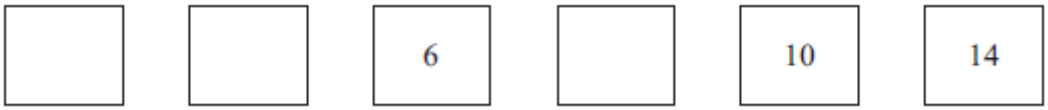
Write your answers in the spaces provided.

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.



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)

©2025 Pearson Education Ltd.

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

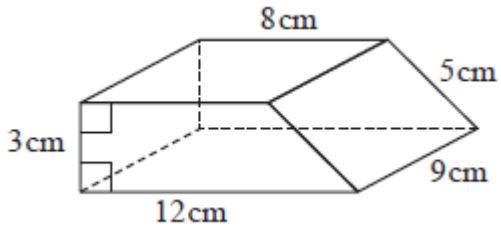


Diagram **NOT** accurately drawn

Work out the total surface area of the prism.

..... cm^2

(Total for Question 2 is 3 marks)

©2025 Pearson Education Ltd.

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

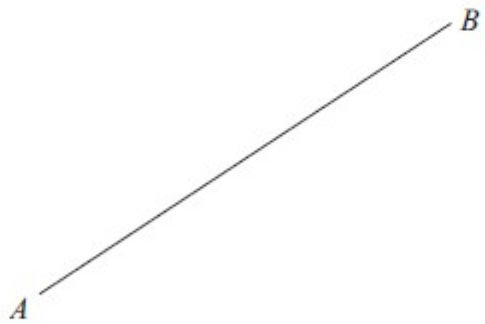
Work out Bernice's percentage loss when she sold the car.

.....%

(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)

©2025 Pearson Education Ltd.

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 nth term of this sequence.

.....

(2)

The nth 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)

©2025 Pearson Education Ltd.

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

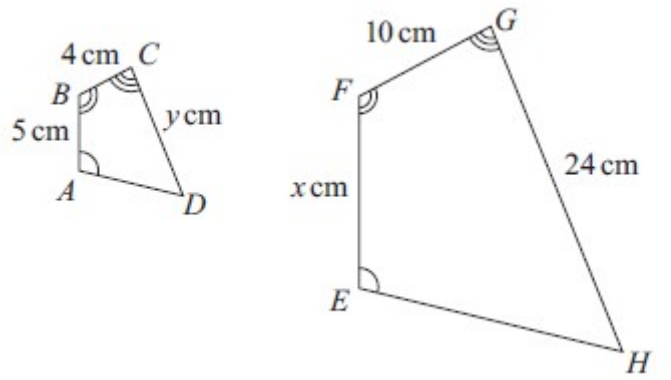


Diagram **NOT** accurately drawn

***AB* = 5 cm** ***BC* = 4 cm** ***CD* = *y* cm**

***EF* = *x* cm** ***FG* = 10 cm** ***GH* = 24 cm**

(a) Work out the value of *x*

x = ...

(2)

(b) Work out the value of *y*

y = ...

(2)

(Total for Question 6 is 4 marks)

©2025 Pearson Education Ltd.

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)

©2025 Pearson Education Ltd.

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**
$0 < m \leqslant 10$	x
$10 < m \leqslant 20$	3
$20 < m \leqslant 30$	2
$30 < m \leqslant 40$	4
$40 < m \leqslant 50$	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

$x =$ .....

(Total for Question 8 is 4 marks)

©2025 Pearson Education Ltd.

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

$$3x + 5y = 8$$
$$4x + y = -3.5$$

Show clear algebraic working.

x = ...

y = ...

(Total for Question 10 is 3 marks)

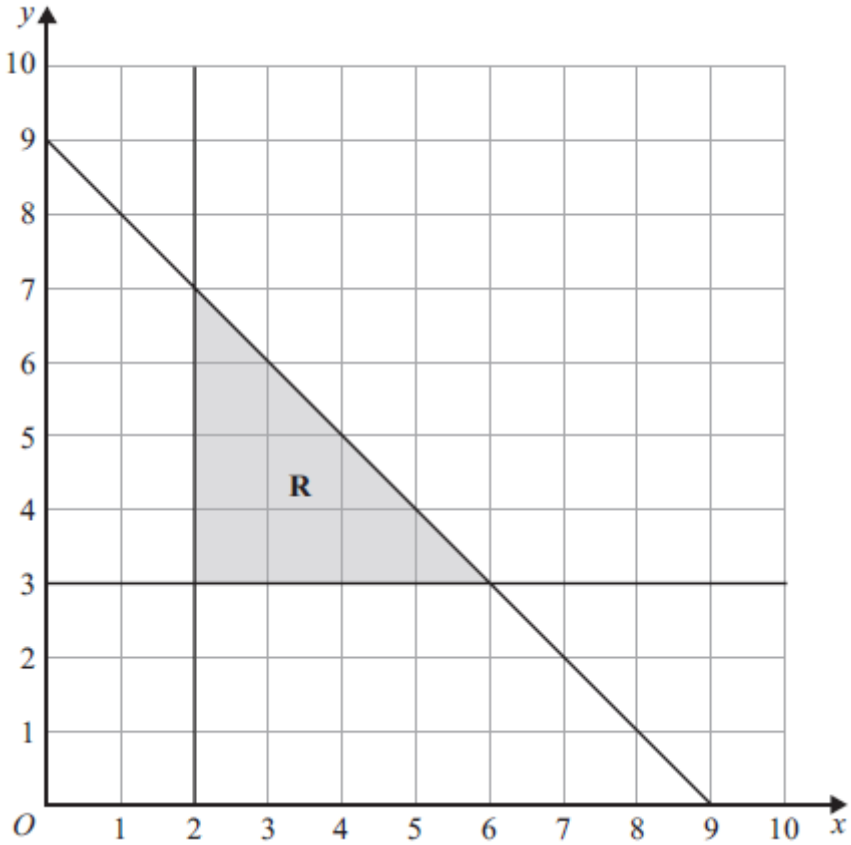
©2025 Pearson Education Ltd.

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)

©2025 Pearson Education Ltd.

12 (a) Write 8.6×10^{-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)

©2025 Pearson Education Ltd.

13 The diagram shows a circle, centre O

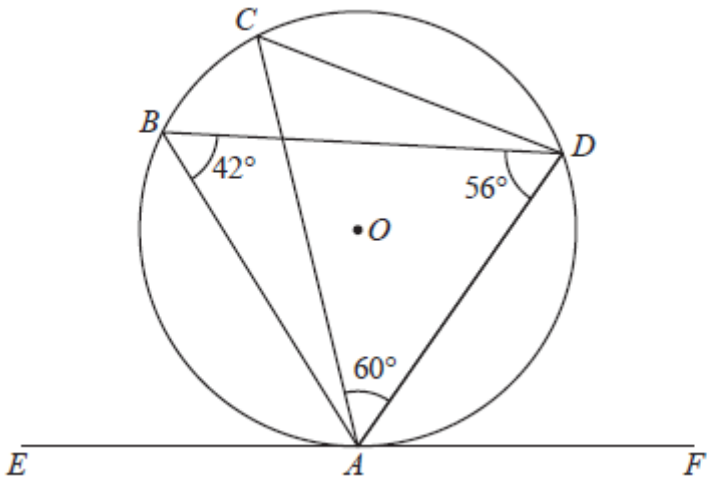


Diagram **NOT** accurately drawn

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

angle ABD = 42° **angle BDA = 56°** **angle CAD = 60°**

(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)

©2025 Pearson Education Ltd.

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

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

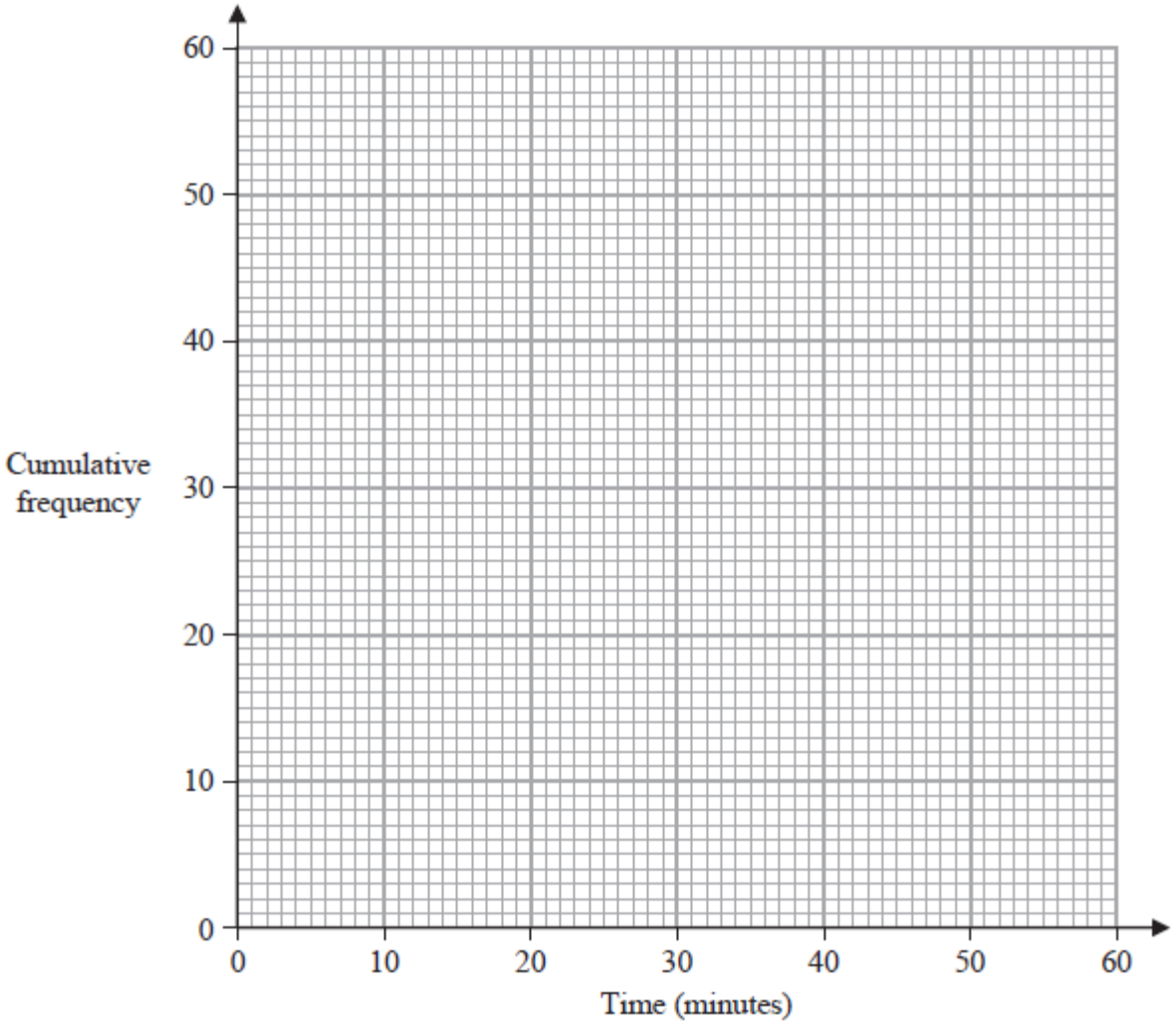
(a) Complete the cumulative frequency table.

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

(1)

(b) On the grid on the next page, draw a cumulative frequency graph for your table.

©2025 Pearson Education Ltd.



(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)

©2025 Pearson Education Ltd.

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)

©2025 Pearson Education Ltd.

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)

©2025 Pearson Education Ltd.

18 W is inversely proportional to y^2

$W = 50$ 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 $c = \dfrac{t^2 + 3}{7 - 8t^2}$

.....

(Total for Question 19 is 4 marks)

©2025 Pearson Education Ltd.

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)

©2025 Pearson Education Ltd.

21 The function g is defined as

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

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

$x =$ .....

(3)

©2025 Pearson Education Ltd.

The function h is defined as

$$h(x) = 5x^2 + 30x - 7 \qquad x \geqslant -3$$

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

$h^{-1}(x) =$ .....

(4)

(Total for Question 21 is 7 marks)

©2025 Pearson Education Ltd.

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.

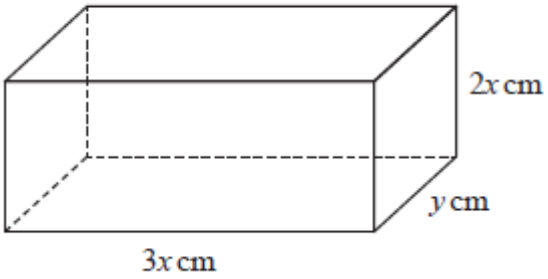
.....

(Total for Question 22 is 4 marks)

©2025 Pearson Education Ltd.

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 cm^3
The total surface area of the cuboid is A 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)

©2025 Pearson Education Ltd.

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.

.....

(Total for Question 24 is 4 marks)

©2025 Pearson Education Ltd.

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

volume of solid **A** − volume of solid **B** = 735 cm³

find the volume of solid **A**

..... cm³

(Total for Question 25 is 4 marks)

©2025 Pearson Education Ltd.

26

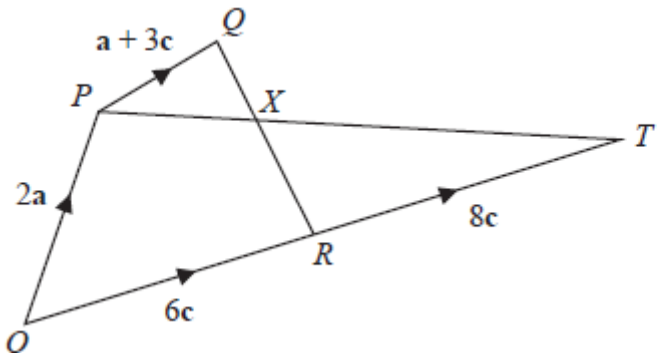


Diagram **NOT** accurately drawn

The diagram shows a quadrilateral $OPQR$ in which

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

(a) Find in terms of **a** and **c**

$\overrightarrow{QR}$ = ...

(1)

The point T is such that $\overrightarrow{RT} = 8\mathbf{c}$
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.

©2025 Pearson Education Ltd.

QX : *XR* = ...

(4)

(Total for Question 26 is 5 marks)

©2025 Pearson Education Ltd.

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)

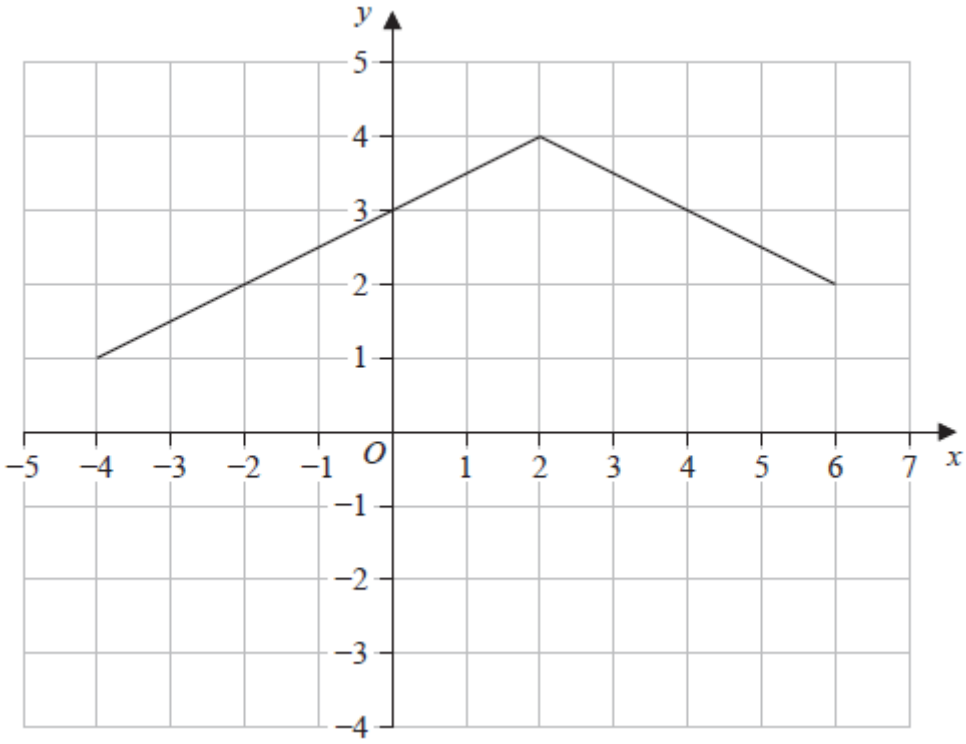
(ii) $y = f(3x)$

(..... , ...)

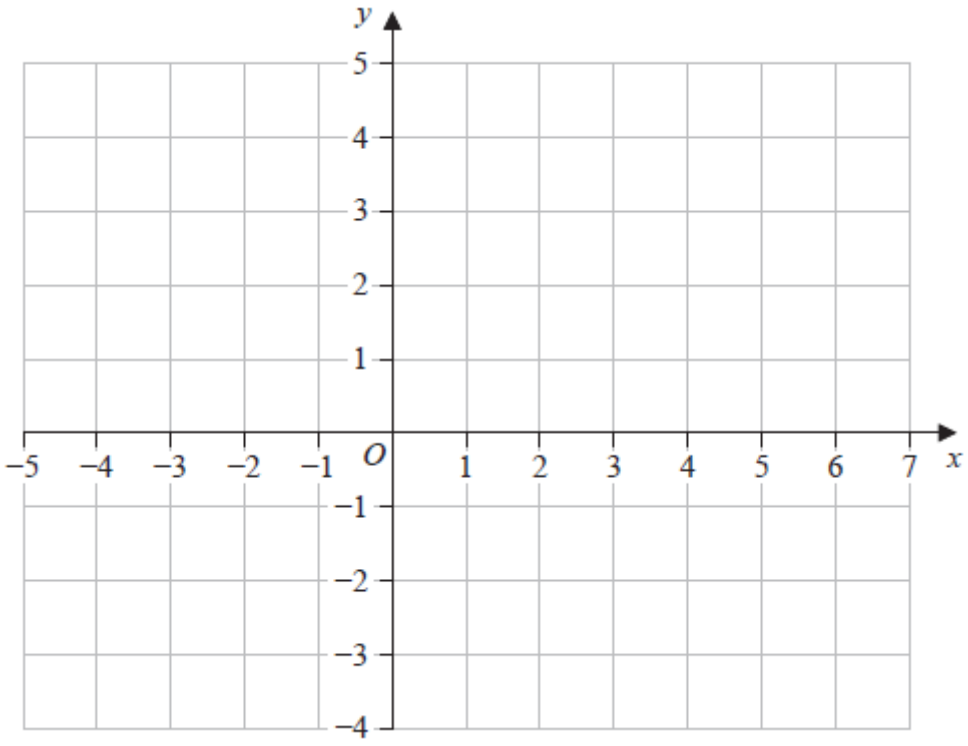
(1)

©2025 Pearson Education Ltd.

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

©2025 Pearson Education Ltd.