Pearson Edexcel International GCSE

Mathematics A

Modular Unit 2

January 2022 Reconstructed Past Paper

STUDENT WORKBOOK

Adaptive working-space edition

38 adaptive question sections 124 marks

Selected from Linear Higher Papers 1H and 2H

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L-to-M | CONVERTED MODULAR EDITION

Selected from Linear Higher papers; not an original Modular examination paper.

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About this reconstructed paper

Each question section keeps the exact source demand beside practical working space. Source pixels are retained once; long source panels continue on numbered pages.

Ownership rule: Unit 2 owns a demand when its assessed or terminal statement is Unit 2, even if Unit 1 skills are prerequisites. This book contains the demands owned by Unit 2; the selection contains 124 marks.

This is an Elite reconstructed teaching paper selected from official Linear Higher material; it is not an official Pearson Modular examination paper. Candidate source assets are retained for private teaching use only.

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Question 01

4MA1-1H Q1 Q1(d)

MODULAR UNIT 2

2 marks

(d) Make t the subject of $c = t^3 - 8v$

.....

(2)

WORKING SPACE

Question 02
4MA1-1H Q2

MODULAR UNIT 2
3 marks

2 Danil, Gabriel and Hadley share some money in the ratios 3 : 5 : 9
The difference between the amount of money that Gabriel receives and the amount of money that Hadley receives is 196 euros.

Work out the amount of money that Danil receives.

..... euros

WORKING SPACE

Question 03
4MA1-1H Q4

MODULAR UNIT 2
5 marks

4 Sarah makes and sells mugs.

One day she makes 150 mugs.
Her total cost for making these mugs is £1140

Of these mugs

$\frac{2}{5}$ are small mugs

32% are medium mugs

and the rest are large mugs

Here is Sarah's price list for selling each mug.

MUGS	
Small	**£8.50**
Medium	**£11.20**
Large	**£14.20**

Sarah sells all 150 mugs.

Work out her percentage profit.
Give your answer correct to the nearest whole number.

.....%

Working space for Question 03

Continue your method

UNIT 2
5 marks

WORKING SPACE

Question 04

4MA1-1H Q5 Q5(a)

MODULAR UNIT 2

3 marks

5 Jenny has six cards.

Each card has a whole number written on it so that

the smallest number is 5
the largest number is 24
the median of the six numbers is 14
the mode of the six numbers is 8

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



(a) For the remaining four cards, write on each dotted line a number that could be on the card.

(3)

Working space for Question 04

Continue your method

UNIT 2
3 marks

WORKING SPACE

Question 05

4MA1-1H Q5 Q5(b)

MODULAR UNIT 2

3 marks

A basketball team plays 6 games.
After playing 5 games, the team has a mean score of 21 points per game.
After playing 6 games, the team has a mean score of 23 points per game.

(b) Work out the number of points the team scored in its 6th game.

.....

(3)

WORKING SPACE

Question 06

4MA1-1H Q6 Q6(a)

MODULAR UNIT 2

2 marks

6 (a) Solve the inequality $5x - 7 \leqslant 2$

.....

(2)

WORKING SPACE

Question 07
4MA1-1H Q8

MODULAR UNIT 2
2 marks

8 $a = 4.2 \times 10^{-24}$ $b = 3 \times 10^{145}$

Work out the value of $a \times b$
Give your answer in standard form.

.....

WORKING SPACE

Question 08

4MA1-1H Q11

MODULAR UNIT 2

3 marks

11 Himari invests 200 000 yen for 3 years in a savings account paying compound interest.

The rate of interest is 1.8% for the first year and x% for each of the second year and the third year.

The value of the investment at the end of the third year is 209 754 yen.

Work out the value of x
Give your answer correct to one decimal place.

$x =$ .....

WORKING SPACE

Question 09

4MA1-1H Q12 Q12(a), Q12(b), Q12(c), Q12(d)

MODULAR UNIT 2
6 marks

12 The table gives information about the times, in minutes, taken by 80 customers to do their shopping in a supermarket.

Time taken (t minutes)	Frequency
$0 < t \leqslant 10$	7
$10 < t \leqslant 20$	26
$20 < t \leqslant 30$	24
$30 < t \leqslant 40$	14
$40 < t \leqslant 50$	7
$50 < t \leqslant 60$	2

(a) Complete the cumulative frequency table.

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

(1)

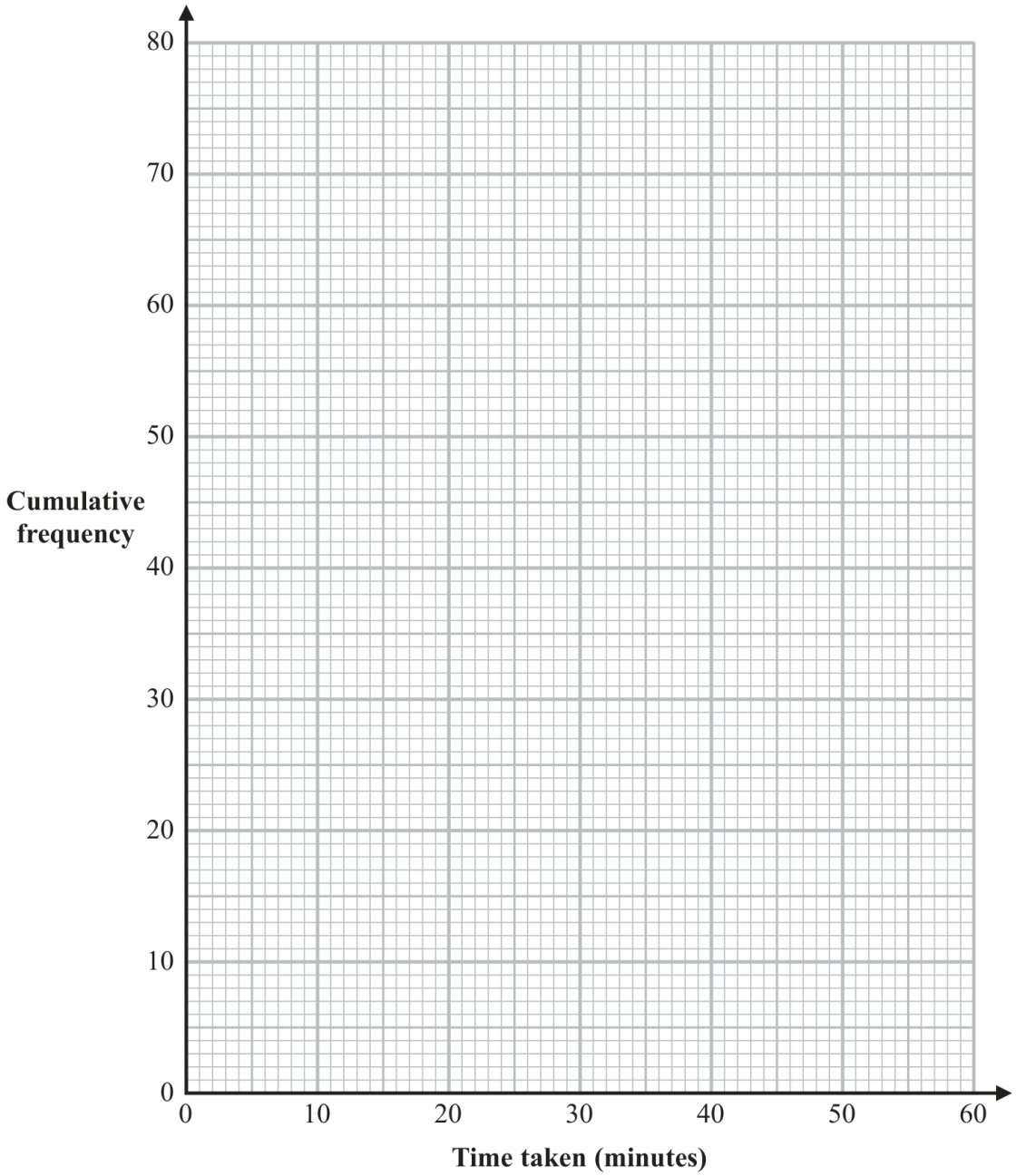
(b) On the grid opposite, draw a cumulative frequency graph for your table.

Question 09 (continued)

4MA1-1H Q12 Q12(a), Q12(b), Q12(c), Q12(d)

MODULAR UNIT 2

6 marks



(2)

Question 09 (continued)

4MA1-1H Q12 Q12(a), Q12(b), Q12(c), Q12(d)

MODULAR UNIT 2

6 marks

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

..... minutes

(1)

One of the 80 customers is chosen at random.

(d) Use your graph to find an estimate for the probability that the time taken by this customer was more than 42 minutes.

.....

(2)

Question 10

4MA1-1H Q15

MODULAR UNIT 2

3 marks

15 A is inversely proportional to C^2

$A = 40$ when $C = 1.5$

Calculate the value of C when $A = 1000$

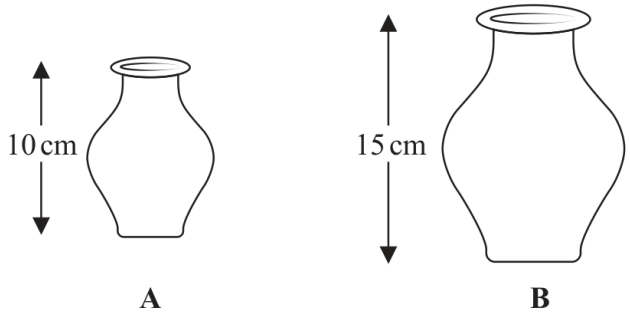
$C =$ .....

WORKING SPACE

Question 11
4MA1-1H Q17

MODULAR UNIT 2
4 marks

17 **A** and **B** are two similar vases.



A **B**

Diagram **NOT** accurately drawn

Vase **A** has height 10 cm.
Vase **B** has height 15 cm.

The difference between the volume of vase **A** and the volume of vase **B** is 1197 cm^3

Calculate the volume of vase **A**

..... cm^3

Working space for Question 11

Continue your method

UNIT 2
4 marks

WORKING SPACE

Question 12
4MA1-1H Q19

MODULAR UNIT 2
5 marks

19 Solve the simultaneous equations

$$3x^2 + y^2 - xy = 5$$
$$y = 2x - 3$$

Show clear algebraic working.

.....

WORKING SPACE

Question 13
4MA1-1H Q22

MODULAR UNIT 2
5 marks

22 The diagram shows triangle OAB

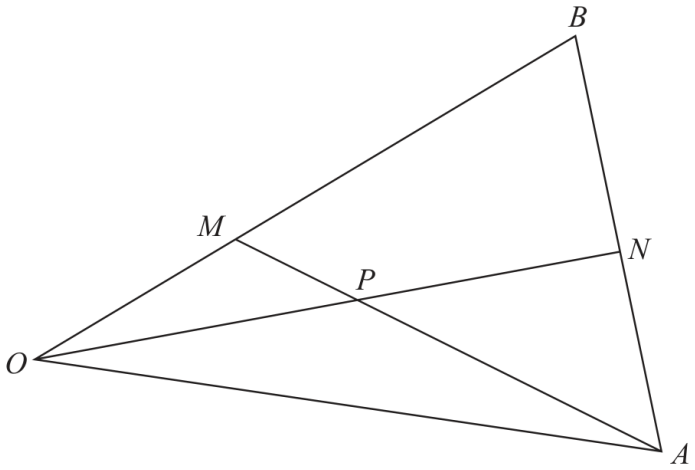


Diagram **NOT** accurately drawn

$\overrightarrow{OA} = 8\mathbf{a}$ $\overrightarrow{OB} = 6\mathbf{b}$

M is the point on OB such that $OM : MB = 1 : 2$
N is the midpoint of AB
P is the point of intersection of ON and AM

Using a vector method, find $\overrightarrow{OP}$ as a simplified expression in terms of **a** and **b**
Show your working clearly.

$\overrightarrow{OP} =$ .....

Working space for Question 13

Continue your method

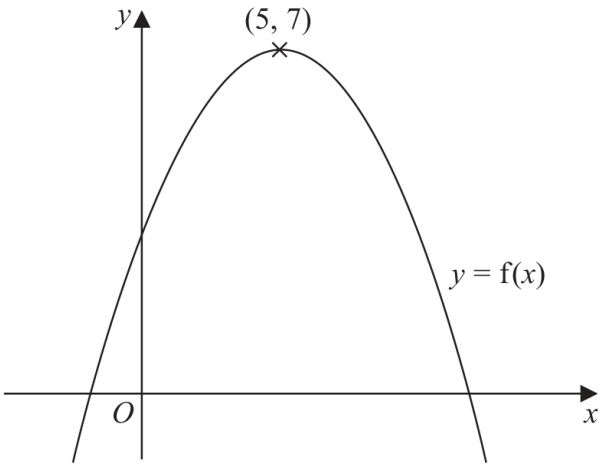
UNIT 2
5 marks

WORKING SPACE

Question 14
4MA1-1H Q23

MODULAR UNIT 2
2 marks

23 The diagram shows a sketch of the curve with equation $y = f(x)$



There is only one maximum point on the curve.
The coordinates of this maximum point are (5, 7)

Write down the coordinates of the maximum point on the curve with equation

(i) $y = f(x + 9)$

(..... , ...)

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

(..... , ...)

Working space for Question 14

Continue your method

UNIT 2
2 marks

WORKING SPACE

Question 15

4MA1-1H Q24

MODULAR UNIT 2

6 marks

24 The curve **C** has equation $y = ax^3 + bx^2 - 12x + 6$ where a and b are constants.

The point A with coordinates $(2, -6)$ lies on **C**
The gradient of the curve at A is 16

Find the y coordinate of the point on the curve whose x coordinate is 3
Show clear algebraic working.

$y =$ .....

WORKING SPACE

Question 16

4MA1-2H Q3 Q3(a)

MODULAR UNIT 2

2 marks

3

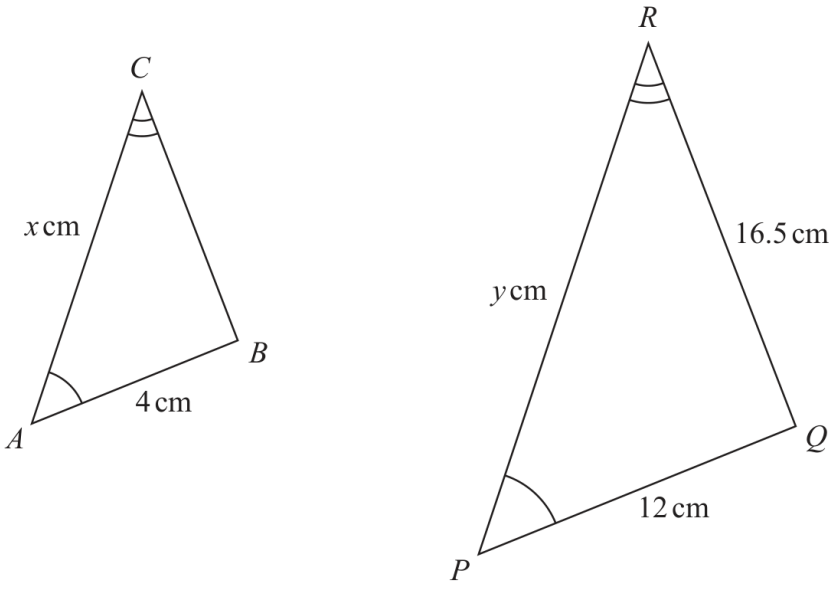


Diagram **NOT** accurately drawn

Triangle ABC is similar to triangle PQR

$AB = 4\,\text{cm}$ $PQ = 12\,\text{cm}$ $RQ = 16.5\,\text{cm}$ $AC = x\,\text{cm}$ $PR = y\,\text{cm}$

(a) Calculate the length of BC

..... cm

(2)

Working space for Question 16

Continue your method

UNIT 2
2 marks

WORKING SPACE

Question 17

4MA1-2H Q3 Q3(b)

MODULAR UNIT 2

1 marks

(b) Write down an expression for y in terms of x

$y =$ .....

(1)

WORKING SPACE

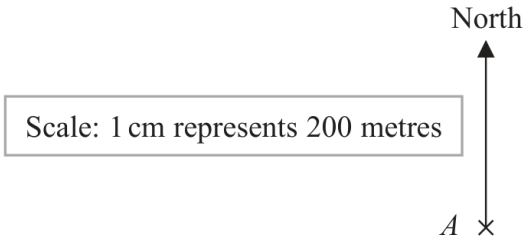
Question 18

4MA1-2H Q5 Q5(a)

MODULAR UNIT 2

3 marks

5 The scale diagram shows the position on a map of a house, A



House C is on a bearing of 110° from A
The distance from A to C is 700 m

(a) Mark the position of C on the diagram with a cross (×)
Label your cross C

(3)

Question 19

4MA1-2H Q5 Q5(b)

MODULAR UNIT 2

1 marks

(b) Write the scale of the map in the form $1 : n$

1 : .....

(1)

WORKING SPACE

Question 20

4MA1-2H Q7

MODULAR UNIT 2

3 marks

7 Find the lowest common multiple (LCM) of 28, 42 and 63
Show your working clearly.

.....

WORKING SPACE

Question 21

4MA1-2H Q8 Q8(a)

MODULAR UNIT 2

2 marks

8 The table gives information about the average house price in England in 2018 and in 2019

Year	**2017**	**2018**	**2019**
Average house price (£)		228 314	231 776

(a) Work out the percentage increase in the average house price from 2018 to 2019
Give your answer correct to one decimal place.

..... %

(2)

WORKING SPACE

Question 22

4MA1-2H Q8 Q8(b)

MODULAR UNIT 2

3 marks

The average house price in 2019 was 7.7% greater than the average house price in 2017

(b) Work out the average house price in 2017
Give your answer correct to 3 significant figures.

£ .....

(3)

WORKING SPACE

Question 23
4MA1-2H Q9

MODULAR UNIT 2
4 marks

9 The frequency table gives information about the number of points scored by a player.

Number of points	Frequency
0	13
1	17
2	8
3	x
4	11

The mean number of points scored is 2

Work out the value of x

$x =$ .....

Working space for Question 23

Continue your method

UNIT 2
4 marks

WORKING SPACE

Question 24

4MA1-2H Q10

MODULAR UNIT 2

3 marks

10 Solve the simultaneous equations

$$3x + 5y = 3.1$$
$$6x + 3y = 3.75$$

Show clear algebraic working.

$x =$ .....

$y =$ .....

WORKING SPACE

Question 25
4MA1-2H Q11

MODULAR UNIT 2
4 marks

11 The diagram shows a regular 10-sided polygon, *ABCDEFGHIJ*

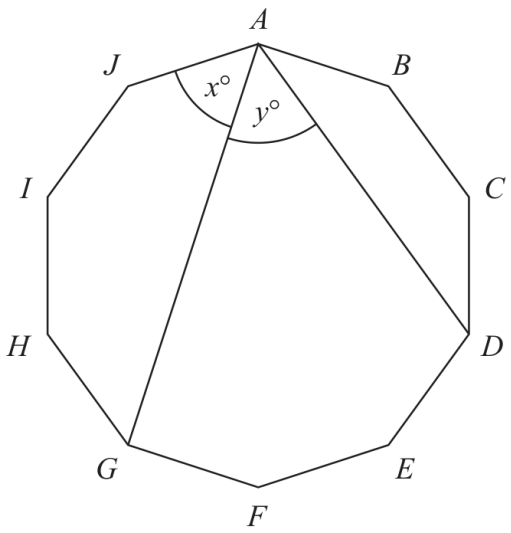


Diagram **NOT** accurately drawn

Show that $x = y$

Working space for Question 25

Continue your method

UNIT 2
4 marks

WORKING SPACE

Question 26

4MA1-2H Q12

MODULAR UNIT 2

3 marks

12 $a = 6 \times 10^{40}$

Work out the value of a^3
Give your answer in standard form.

.....

WORKING SPACE

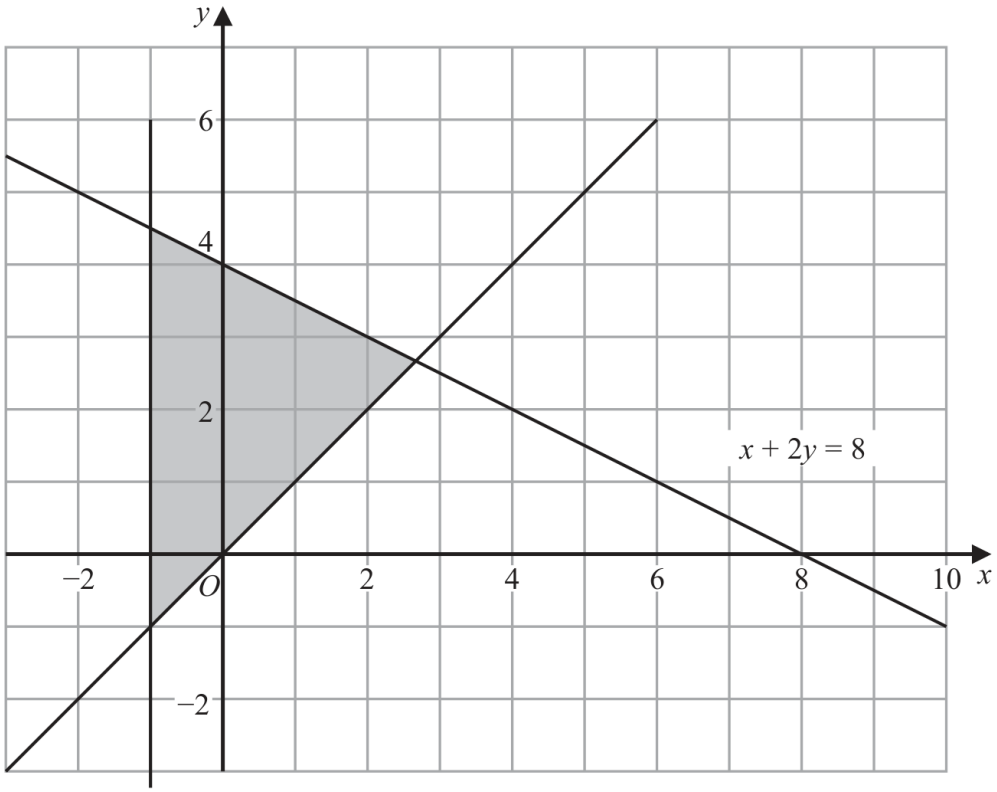
Question 27

4MA1-2H Q13

MODULAR UNIT 2

3 marks

13 The shaded region in the diagram is bounded by three lines.
The equation of one of the lines is given.



Write down three inequalities that define the shaded region.

.....

.....

.....

Working space for Question 27

Continue your method

UNIT 2
3 marks

WORKING SPACE

Question 28

4MA1-2H Q15

MODULAR UNIT 2

3 marks

15 Diyar recorded the distance, in kilometres, that he cycled each day for 11 days.
Here are his results.

8 10 12 13 5 23 21 7 5 16 14

Find the interquartile range of his results.

..... km

WORKING SPACE

Question 29

4MA1-2H Q16

MODULAR UNIT 2

4 marks

16 D, E, F and G are points on a circle, centre O

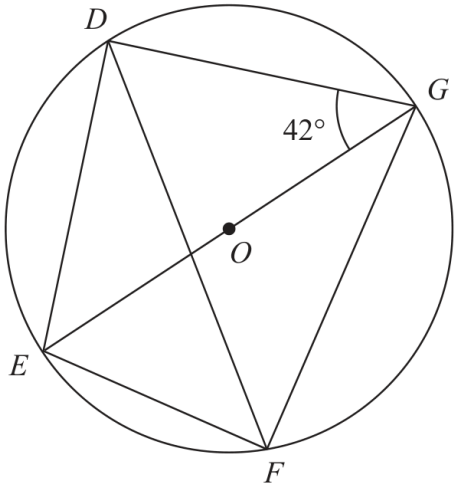


Diagram **NOT** accurately drawn

EOG is a diameter of the circle.

Angle $EGD = 42°$

Calculate the size of angle DFG
Give a reason for each stage of your working.

Angle DFG = ... °

Working space for Question 29

Continue your method

UNIT 2
4 marks

WORKING SPACE

Question 30

4MA1-2H Q18

MODULAR UNIT 2

3 marks

18 Prove that when the sum of the squares of any two consecutive odd numbers is divided by 8, the remainder is always 2
Show clear algebraic working.

WORKING SPACE

Question 31
4MA1-2H Q19

MODULAR UNIT 2
3 marks

19

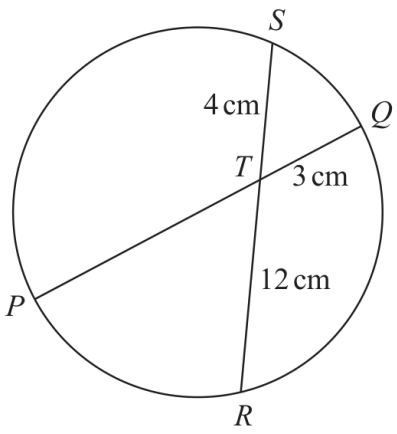


Diagram **NOT** accurately drawn

PTQ is a diameter of a circle.
RTS is a chord of the circle.

$TQ = 3$ cm $\quad ST = 4$ cm $\quad TR = 12$ cm

Calculate the radius of the circle.

..... cm

Working space for Question 31

Continue your method

UNIT 2
3 marks

WORKING SPACE

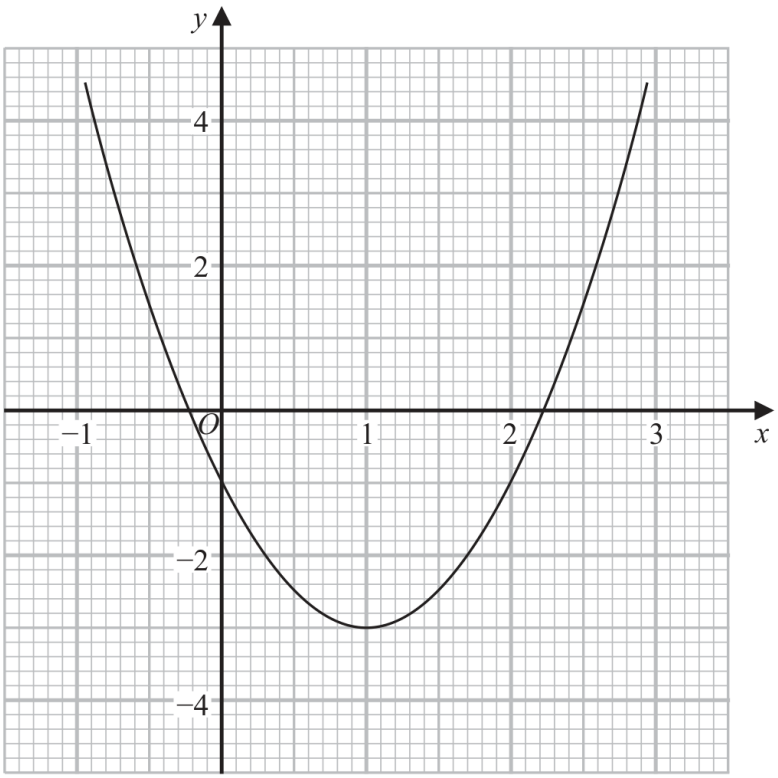
Question 32

4MA1-2H Q21 Q21(a)

MODULAR UNIT 2

2 marks

21 Part of the graph of $y = 2x^2 - 4x - 1$ is shown on the grid.



(a) Use the graph to find estimates for the solutions of the equation $2x^2 - 4x - 1 = 0$
Give your solutions correct to one decimal place.

.....

(2)

Working space for Question 32

Continue your method

UNIT 2
2 marks

WORKING SPACE

Question 33

4MA1-2H Q21 Q21(b)

MODULAR UNIT 2

3 marks

(b) By drawing a suitable straight line on the grid, find estimates for the solutions of the equation $x^2 - x - 1 = 0$

Show your working clearly.

Give your solutions correct to one decimal place.

.....

(3)

Question 34
4MA1-2H Q22

MODULAR UNIT 2
5 marks

22 Here is a rectangle.



Diagram **NOT** accurately drawn

Given that the area of the rectangle is less than 75 cm^2

find the range of possible values of x

.....

WORKING SPACE

Question 35

4MA1-2H Q24

MODULAR UNIT 2

5 marks

24 A particle P moves along a straight line that passes through the fixed point O

The displacement, x metres, of P from O at time t seconds, where $t \geqslant 0$, is given by

$$x = 4t^3 - 27t + 8$$

The direction of motion of P reverses when P is at the point A on the line.

The acceleration of P at the instant when P is at A is $a\,\text{m/s}^2$

Find the value of a

$a =$ .....

WORKING SPACE

Question 36

4MA1-2H Q25 Q25(a)

MODULAR UNIT 2

4 marks

25 The function g is defined as

$$g : x \mapsto 5 + 6x - x^2 \quad \text{with domain} \quad \{x : x \geqslant 3\}$$

(a) Express the inverse function g^{-1} in the form $g^{-1} : x \mapsto \ldots$

$g^{-1} : x \mapsto$ .....

(4)

WORKING SPACE

Question 37

4MA1-2H Q25 Q25(b)

MODULAR UNIT 2

1 marks

(b) State the domain of g^{-1}

.....

(1)

WORKING SPACE

Question 38

4MA1-2H Q26

MODULAR UNIT 2

5 marks

26 An arithmetic series has first term a and common difference d, where d is a prime number.

The sum of the first n terms of the series is S_n and

$S_m = 39$

$S_{2m} = 320$

Find the value of d and the value of m
Show clear algebraic working.

$d =$ .....

$m =$ .....

WORKING SPACE