

Centre No.						Paper Reference						Surname	Initial(s)	
Candidate No.						1	3	8	0	/	3	H	Signature	

Paper Reference(s)

1380/3H

Edexcel GCSE

Mathematics (Linear) – 1380

Paper 3 (Non-Calculator)

Higher Tier

Monday 18 May 2009 – Afternoon

Time: 1 hour 45 minutes

Examiner's use only

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Team Leader's use only

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Materials required for examination

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers

Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.

Check that you have the correct question paper.

Answer ALL the questions. Write your answers in the spaces provided in this question paper.

You must NOT write on the formulae page.

Anything you write on the formulae page will gain NO credit.

If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2).

There are 26 questions in this question paper. The total mark for this paper is 100.

There are 24 pages in this question paper. Any blank pages are indicated.

Calculators must not be used.

Advice to Candidates

Show all stages in any calculations.

Work steadily through the paper. Do not spend too long on one question.

If you cannot answer a question, leave it and attempt the next one.

Return at the end to those you have left out.

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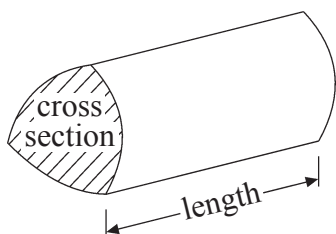
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GCSE Mathematics (Linear) 1380

Formulae: Higher Tier

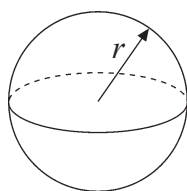
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



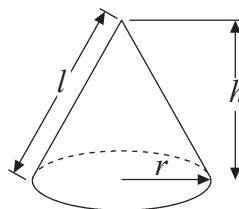
Volume of sphere = $\frac{4}{3}\pi r^3$

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

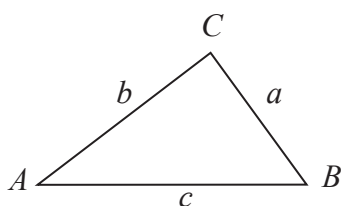


Volume of cone = $\frac{1}{3}\pi r^2 h$

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



In any triangle ABC



The Quadratic Equation

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

where $a \neq 0$, are given by

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

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 = $\frac{1}{2}ab \sin C$



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Answer ALL TWENTY SIX questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1. The two-way table gives some information about how 100 children travelled to school one day.

	Walk	Car	Other	Total
Boy	15	25 ✓	14	54
Girl	22 ✓	8	16	46 ✓
Total	37	33 ✓	30 ✓	100

- (a) Complete the two-way table.

(3)

One of the children is picked at random.

- (b) Write down the probability that this child walked to school that day.

$\frac{37}{100}$ children walk to school

$\frac{37}{100}$ ✓

(1)

(Total 4 marks)

Q1

4

2. (a) Simplify $4x + 3y - 2x + 5y$

$4x - 2x + 3y + 5y$
 $= 2x + 8y$

$2x + 8y$ ✓ (2)

Compasses cost c pence each.
 Rulers cost r pence each.

- (b) Write down an expression for the total cost, in pence, of 2 compasses and 4 rulers.

$2c + 4r$ ✓
 pence

(2)

(Total 4 marks)

Q2

4



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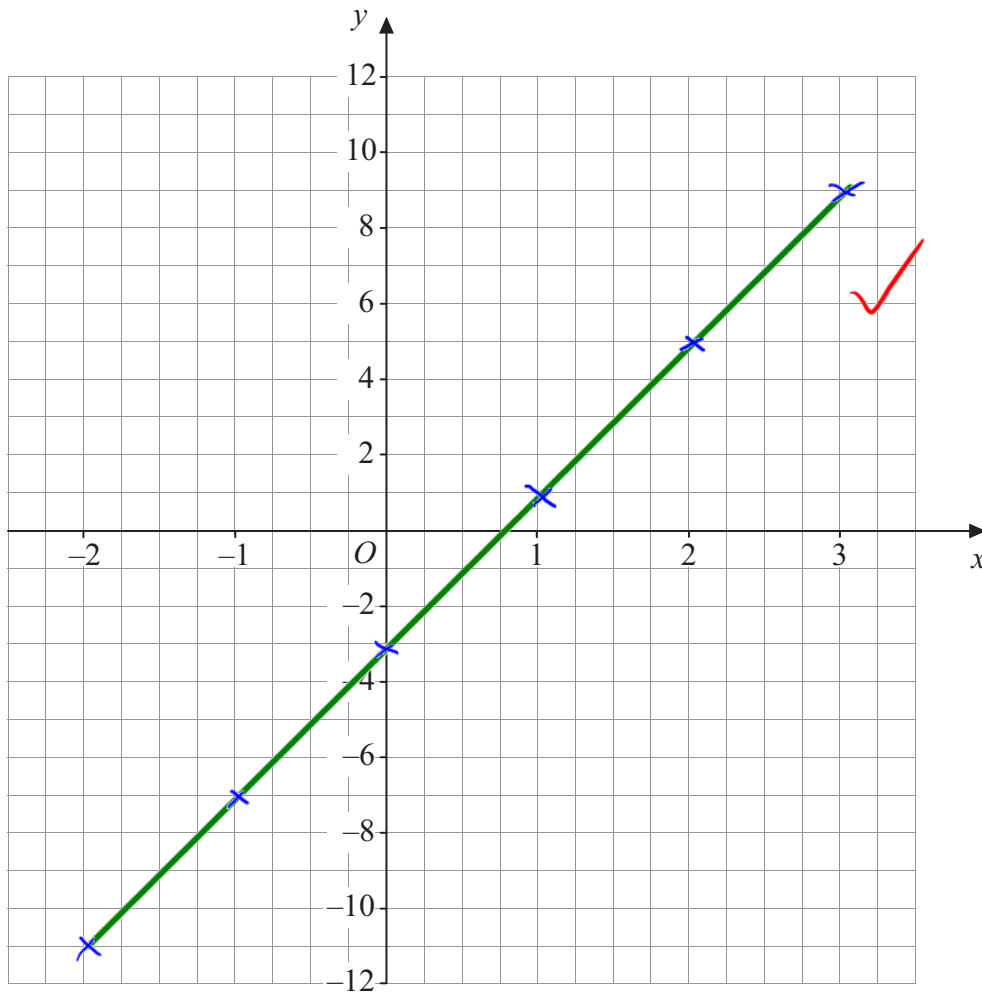
3. (a) Complete the table of values for $y = 4x - 3$

x	-2	-1	0	1	2	3
y	-11	-7 ✓	-3	1 ✓	5 ✓	9
$4x$	-8	-4	0	4	8	12
-3	-3	-3	-3	-3	-3	-3

(2)

2

(b) On the grid, draw the graph of $y = 4x - 3$, for values of x from -2 to 3



2

(2)

(Total 4 marks)

Q3

4



Leave
blank

4. $P = 4k - 10$

$P = 50$

(a) Work out the value of k .

$$4k - 10 = 50$$

$$(+10) \quad 4k = 60$$

$$k = 15$$

$$\underline{k = 15} \quad \checkmark$$

(2)

2

$y = 4n - 3d$

$n = 2$

$d = 5$

(b) Work out the value of y .

$$y = (4 \times 2) - (3 \times 5)$$

$$= 8 - 15$$

$$= -7$$

$$\underline{y = -7} \quad \checkmark$$

(2)

2

(Total 4 marks)

Q4

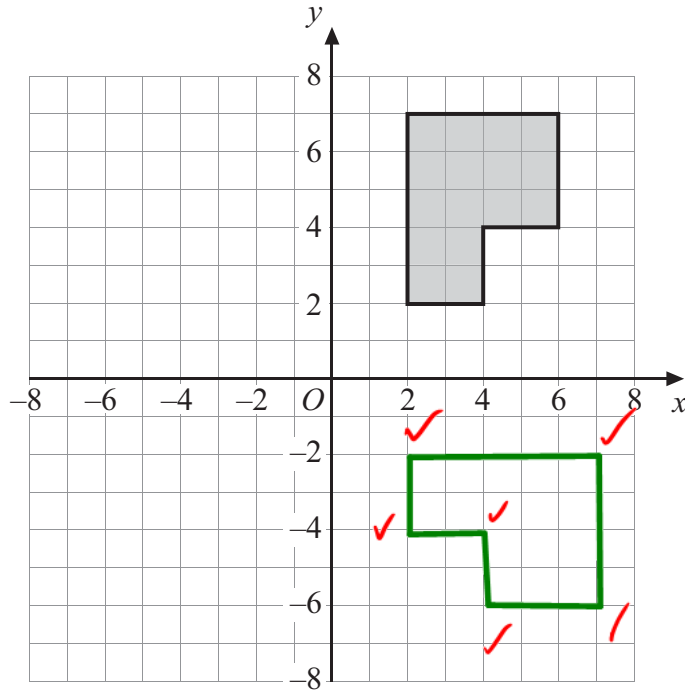
4



N 3 4 7 3 0 A 0 5 2 4

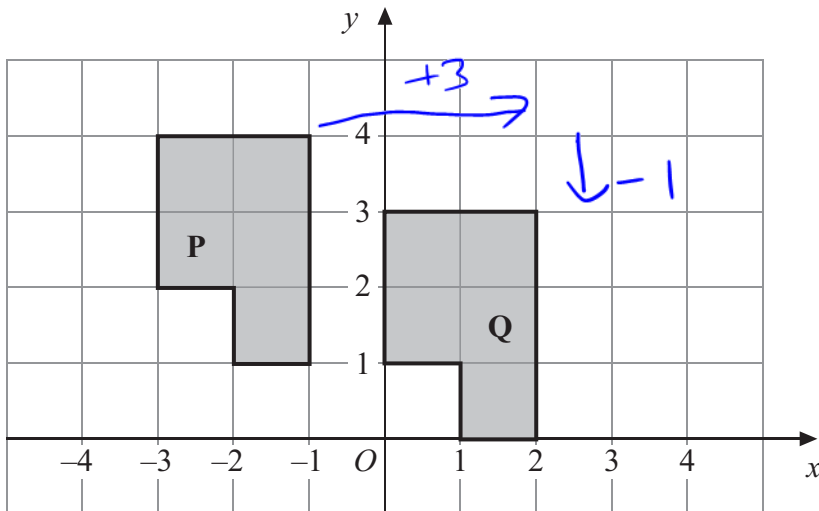
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5.



(a) Rotate the shaded shape 90° clockwise about the point O .

(2)



(b) Describe fully the single transformation that will map shape **P** onto shape **Q**.

A TRANSLATION of $\begin{pmatrix} 3 \\ -1 \end{pmatrix}$

(2)

(Total 4 marks)

Q5

4



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6.

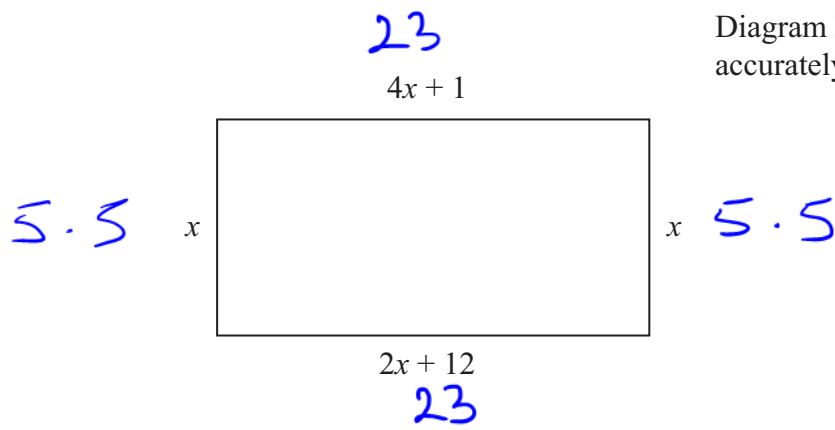


Diagram NOT accurately drawn

The diagram shows a rectangle.
All the measurements are in centimetres.

(a) Explain why $4x + 1 = 2x + 12$

Opposite sides in a rectangle are equal ✓ (1)

(b) Solve $4x + 1 = 2x + 12$

$$\begin{aligned} (-2x) \quad 2x + 1 &= 12 \\ (-1) \quad 2x &= 11 \\ (\div 2) \quad x &= 5.5 \end{aligned}$$

$x = 5.5$ ✓ (2)

(c) Use your answer to part (b) to work out the perimeter of the rectangle.

$$5.5 + 5.5 + 23 + 23 = 57 \text{ cm}$$

57 ✓ cm (2)

(Total 5 marks)

Q6

5



Leave blank

7. Use the information that

$$322 \times 48 = 15456$$

to find the value of

(a) $3.22 \times 4.8 = 15.456$

↑ ↑ ↑
 100x less 10x less 1000x less

100 x less
 move d.p 2
 places left

15.456 ✓

(1)

(b) $0.322 \times 0.48 = 0.15456$

↑ ↑ ↑
 10 x less than (a) 10x less than (a) 100 x less than (a)

0.15456 ✓

(1)

(c) $15456 \div 4.8 = 3220$

↑ ↑
 10x less than 48 10x more than 322

3220 ✓

(1)

(Total 3 marks)

Q7

3

8. $2x^2 = 72$

(a) Find a value of x .

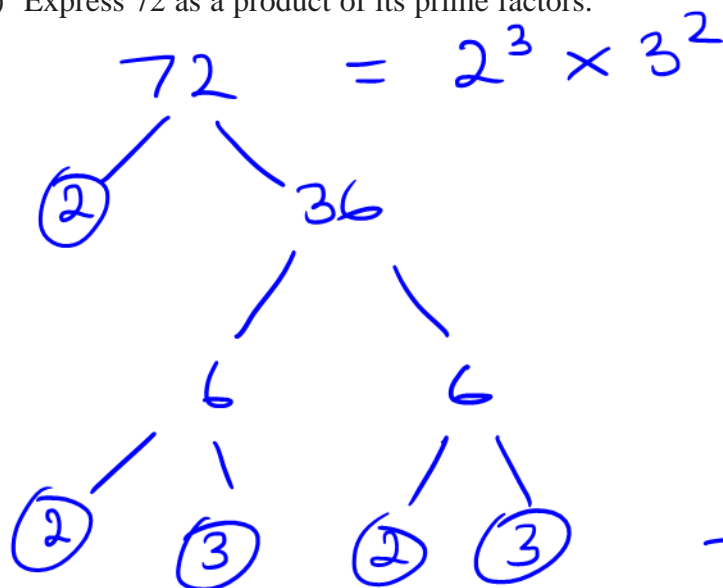
$(\div 2) \quad x^2 = 36$

$(\sqrt{\quad}) \quad x = 6$

$x = 6$ ✓

(2)

(b) Express 72 as a product of its prime factors.



$72 = 2^3 \times 3^2$ ✓

(2)

(Total 4 marks)

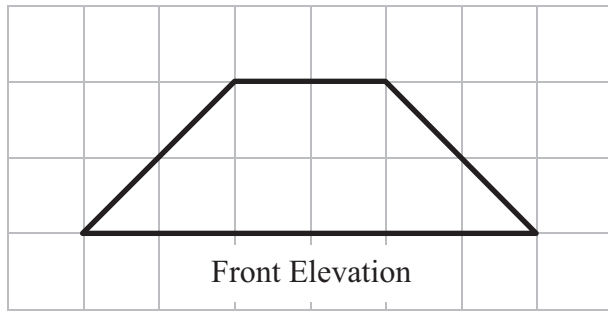
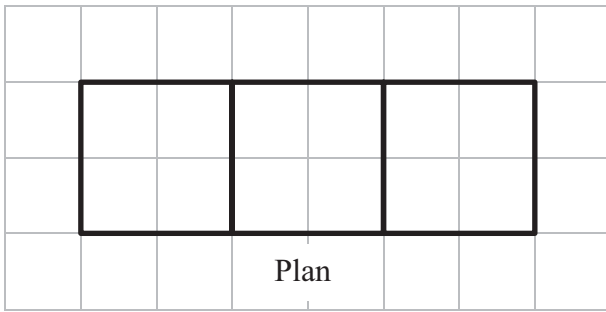
Q8

4

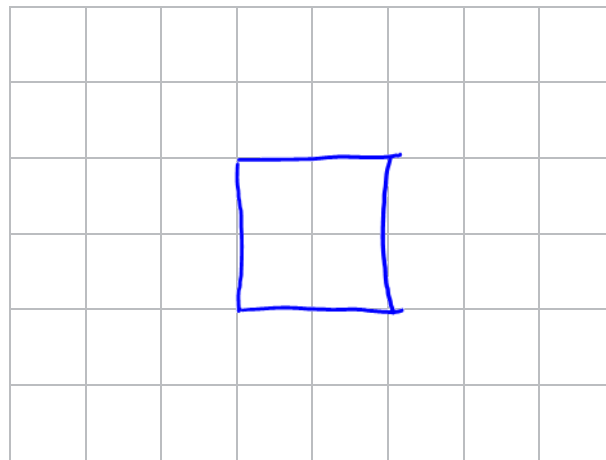


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9. Here are the plan and front elevation of a solid shape.



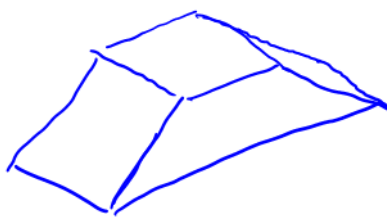
(a) On the grid below, draw the side elevation of the solid shape.



2

(2)

(b) In the space below, draw a sketch of the solid shape.



2

(2)

(Total 4 marks)

Q9

4



Leave
blank

10. There are 40 litres of water in a barrel.

The water flows out of the barrel at a rate of 125 millilitres per second.

1 litre = 1000 millilitres.

Work out the time it takes for the barrel to empty completely.

$$40 \text{ litres} = 40,000 \text{ ml}$$

$$\begin{array}{r} 320 \\ 125 \overline{) 40000} \\ \underline{375} \\ 250 \\ \underline{250} \\ 00 \end{array}$$

$$40000 \div 125 = 320 \text{ seconds}$$

$$320 \text{ seconds}$$

(Total 3 marks)

Q10

3



Leave blank

11. The length of a line is 63 centimetres, correct to the nearest centimetre.

(a) Write down the **least** possible length of the line.

accuracy = 1 cm
 tolerance = $1 \div 2 = 0.5$
 62.5 ✓ centimetres (1)

(b) Write down the **greatest** possible length of the line.

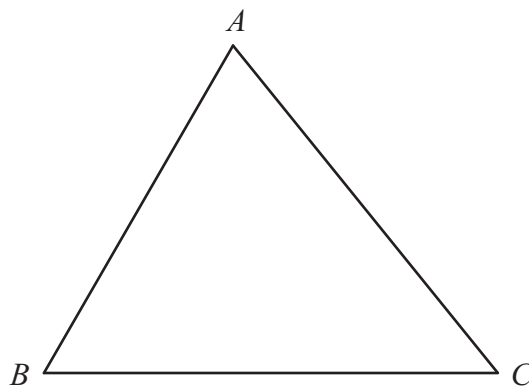
lower bound = $63 - 0.5$
 upper bound = $63 + 0.5$
 63.5 ✓ centimetres (1)

(Total 2 marks)

Q11

2

12.



ABC is a triangle.

Shade the region inside the triangle which is **both**

and less than 4 centimetres from the point B
 closer to the line AC than the line AB.

(Total 4 marks)

Q12



Leave blank

13. Fred is going to take a survey of the magazines read by students.

He wants to design a questionnaire.

(a) Design a suitable question that he could use to find out what types of magazine students read.

What types of magazine do you read?
(tick all that apply) ✓

SPORT FASHION LIFESTYLE Gossip OTHER

(2)

2

Fred put the question below on his questionnaire.

'How many magazines have you read?'

A few

A lot

(b) Design a better question.

You should include some response boxes.

How many magazines have you read in the PAST MONTH? ✓

none 1 2-3 4-5 more than 5 ✓

(2)

2

Q13

(Total 4 marks)

4



Leave blank

14. Work out an estimate for the value of

$$\frac{6.8 \times 191}{0.051}$$

round to 1 sf
before calculating

$$\frac{7 \times 200}{0.05} = \frac{1400}{0.05} = 1400 \times 20 = 28000$$

(dividing by 0.5 same as $\times 2$
" " " 0.05 " " $\times 20$)

$$\underline{28000}$$

(Total 3 marks)

Q14

3

15. (a) Write 64000 in standard form.

$$64000 = 6.4 \times 10^4$$

$$\underline{6.4 \times 10^4} \quad (1)$$

(b) Write 156×10^{-7} in standard form.

$$\div 100 \quad \downarrow \times 100$$

$$1.56 \times 10^{-5}$$

$$\underline{1.56 \times 10^{-5}} \quad (1)$$

(Total 2 marks)

Q15

2

16. (a) Factorise fully $4x^2 - 6xy$

highest common factor $2x$

$$2x(2x - 3y)$$

$$\underline{2x(2x - 3y)} \quad (2)$$

(b) Factorise $x^2 + 5x - 6$

-1×6
 -2×3
 -3×2
 -6×1

$$\underline{(x-1)(x+6)} \quad (2)$$

(Total 4 marks)

Q16

4



17. Lucy did a survey about the amounts of money spent by 120 men during their summer holidays.

The cumulative frequency table gives some information about the amounts of money spent by the 120 men.

Amount (£A) spent	Cumulative frequency
$0 \leq A < 100$	13
$0 \leq A < 150$	25
$0 \leq A < 200$	42
$0 \leq A < 250$	64
$0 \leq A < 300$	93
$0 \leq A < 350$	110
$0 \leq A < 400$	120

- (a) On the grid, draw a cumulative frequency diagram.

(2)

2

- (b) Use your cumulative frequency diagram to estimate the median.

£ 240 ✓
.....
..... (2)

2

A survey of the amounts of money spent by 200 women during their summer holidays gave a median of £205

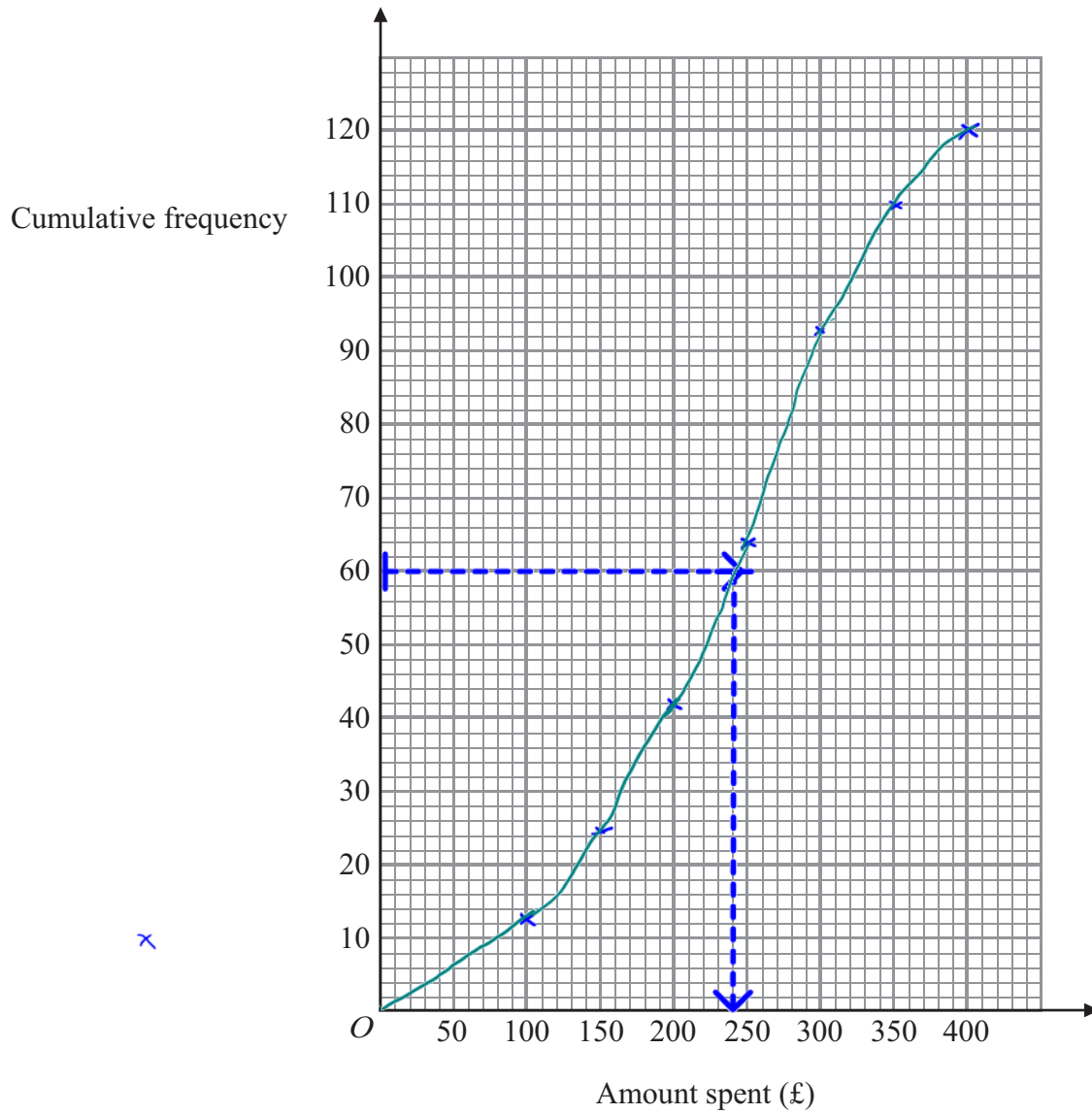
- (c) Compare the amounts of money spent by the women with the amounts of money spent by the men.

The MEDIAN amount spent by men is £240. This
.....
is greater than the MEDIAN amount spent by women.
.....
This suggests that men spend more on holiday. ✓ (1)

1



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x

(Total 5 marks)

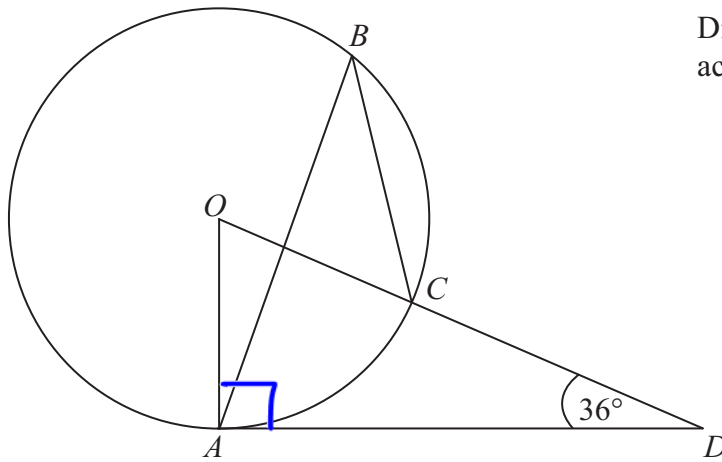
Q17

5



18.

Diagram NOT accurately drawn



The diagram shows a circle centre O .
 A , B and C are points on the circumference.

DCO is a straight line.
 DA is a tangent to the circle.

Angle $ADO = 36^\circ$

(a) Work out the size of angle AOD .

TANGENTS meet RADII at 90°
 $\hat{AOD} = 180 - (90 + 36)$
 $= 180 - 126$
 $= 54^\circ$

54 ✓

 (2)

(b) (i) Work out the size of angle ABC .

.....
 (2)

(ii) Give a reason for your answer.

.....
 (3)

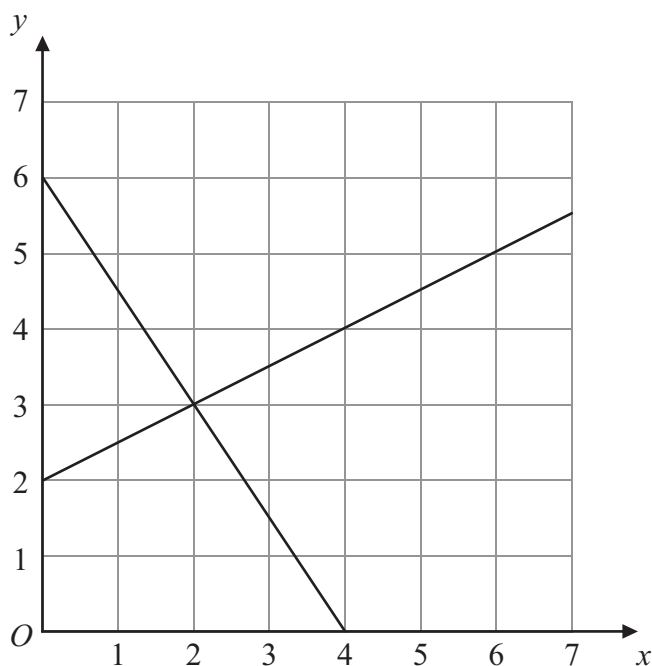
(Total 5 marks)

Q18



Leave blank

19.



The diagram shows graphs of $y = \frac{1}{2}x + 2$

and $2y + 3x = 12$

(a) Use the diagram to solve the simultaneous equations

$$y = \frac{1}{2}x + 2$$

$$2y + 3x = 12$$

$x = \dots\dots\dots y = \dots\dots\dots$
(1)

(b) Find an equation of the straight line which is parallel to the line $y = \frac{1}{2}x + 2$ and passes through the point (0, 4).

$\dots\dots\dots$
(2)

(Total 3 marks)

Q19



Leave blank

20. (a) Solve the inequality

$$3t + 1 < t + 12$$

.....
(2)

(b) t is a whole number.

Write down the largest value of t that satisfies

$$3t + 1 < t + 12$$

.....
(1)

(Total 3 marks)

Q20

21. M is directly proportional to L^3 .

When $L = 2$, $M = 160$

Find the value of M when $L = 3$

.....
(Total 4 marks)

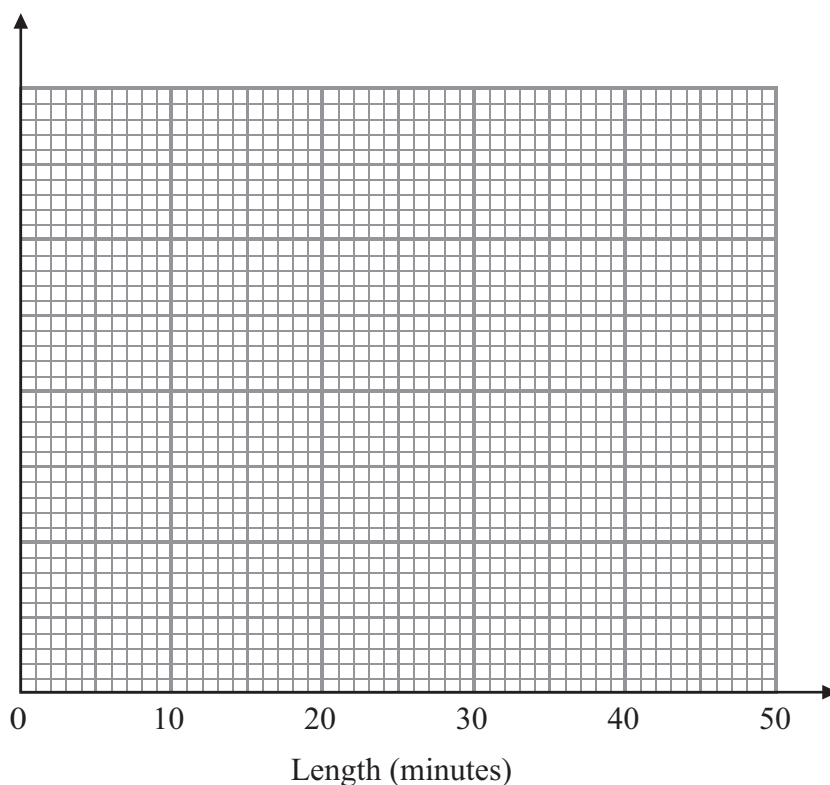
Q21



22. A call centre receives 64 telephone calls one morning.
The table gives information about the lengths, in minutes, of these telephone calls.

Length (x) minutes	Frequency
$0 < x \leq 5$	4
$5 < x \leq 15$	10
$15 < x \leq 30$	24
$30 < x \leq 40$	20
$40 < x \leq 45$	6

Draw a histogram for this information.

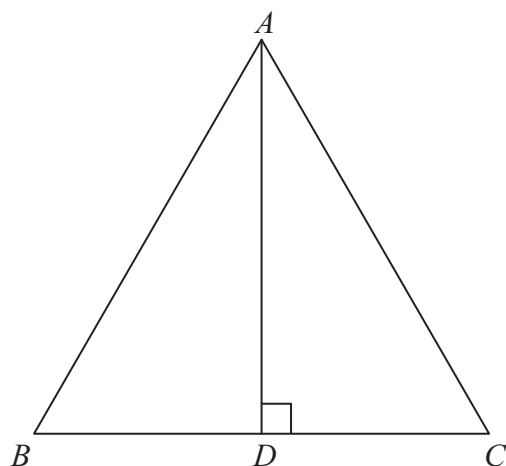


(Total 4 marks)

Q22



24.

Diagram **NOT**
accurately drawn

ABC is an equilateral triangle.

D lies on BC .

AD is perpendicular to BC .

(a) Prove that triangle ADC is congruent to triangle ADB .

(3)

(b) Hence, prove that $BD = \frac{1}{2}AB$.

(2)

Q24

(Total 5 marks)



Leave
blank

25.

$$\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$$

$$u = 2\frac{1}{2}, v = 3\frac{1}{3}$$

(a) Find the value of f .

.....
(3)

(b) Rearrange $\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$ to make u the subject of the formula.

Give your answer in its simplest form.

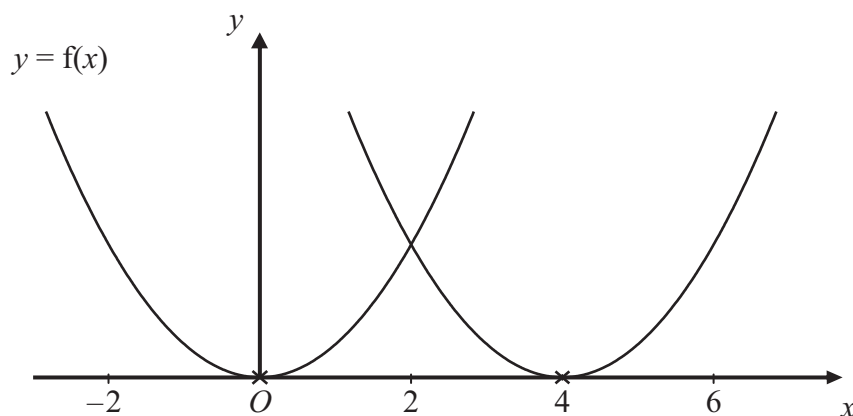
.....
(2)

(Total 5 marks)

Q25



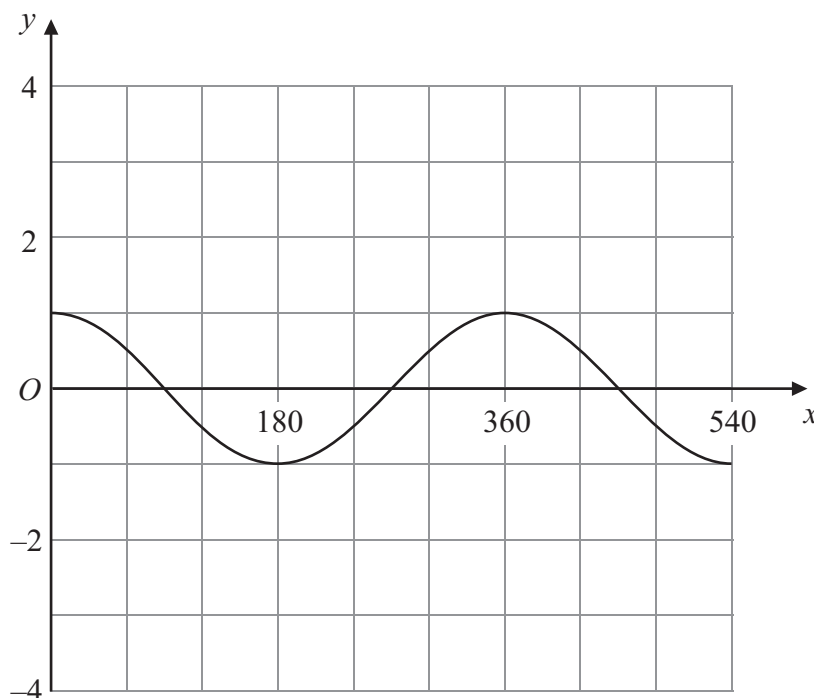
26.



The curve with equation $y = f(x)$ is translated so that the point at $(0, 0)$ is mapped onto the point $(4, 0)$.

(a) Find an equation of the translated curve.

.....
(2)



The grid shows the graph of $y = \cos x^\circ$ for values of x from 0 to 540

(b) On the grid, sketch the graph of $y = 3 \cos(2x^\circ)$ for values of x from 0 to 540

(2) **Q26**

(Total 4 marks)

TOTAL FOR PAPER: 100 MARKS

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