WORKED SOLUTIONS

April Practice Paper No. 9

Write your name here

Surname	Other names

Pearson Edexcel
Level 1/Level 2 GCSE (9 - 1)

Centre Number | | | | | |

Candidate Number | | | | |

Mathematics

Paper 3 (Calculator)

Foundation Tier

Sample Assessment Materials - Issue 2
Time: 1 hour 30 minutes

Paper Reference
1MA1/3F

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator.

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.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

My Mark: .....

My target for the actual GCSE: .....

Action to help me reach my target:

(e.g. MW clips you will take notes on)

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

MW 31

1 Write 2148 correct to the nearest 100

2100 B1

(Total for Question 1 is 1 mark)

2 (a) Simplify $8x - 3x + 2x$

MW 33

7x B1

(1)

(b) Simplify $4y \times 2y$

MW 34

$8y^2$ B1

(1)

(Total for Question 2 is 2 marks)

3 There are 6760 people at at a rugby match.
3879 of the people are men.
1241 of the people are women.

$\frac{1}{4}$ of the children are girls.

Work out how many boys are at the rugby match.

* use your calculator!

MW 72

Number of children = 6760 − 3879 − 1241 P1
= 1640

$\frac{1}{4}$ of 1640 = 410 P1 No. of boys = 1640 − 410 = 1230 A1

(Total for Question 3 is 3 marks)

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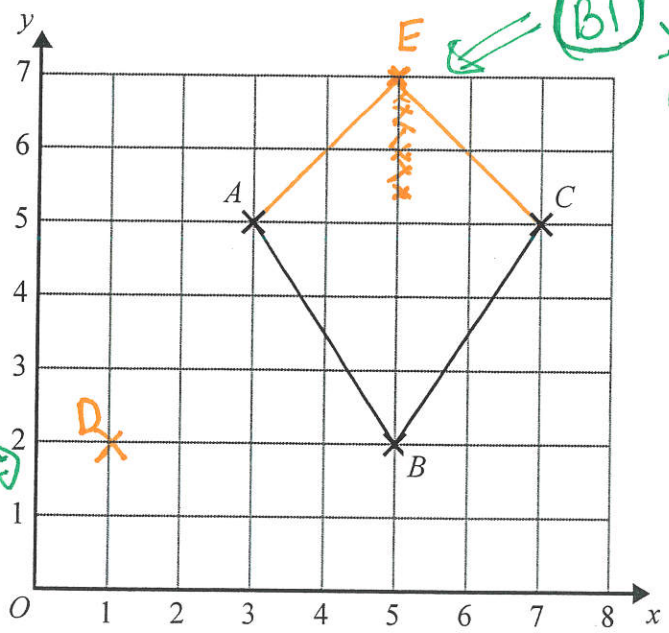
4 Here is a grid showing the points A, B and C.

MW8



E (B1) Any point lying on (5, y) where 5 < y ≤ 7

Plotting the point (B1)

(a) Write down the coordinates of the point A.

(3, 5) (B1)

(1)

(b) On the grid, mark with a cross (×) the point (1, 2).
Label this point D.

(1)

(c) On the grid, mark with a cross (×) a point E, so that the quadrilateral $ABCE$ is a kite.

(1)

(Total for Question 4 is 3 marks)

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5 Faiza buys

one magazine costing £2.30
one paper costing 92p
two identical bars of chocolate

Faiza pays with a £5 note.
She gets 40p change.

Work out the cost of **one** bar of chocolate.

MW 22b

Amount she is charged
= £5.00 − 40p (P1)
= £4·60

OR
£2·30 + 92p
= £3·22

£4·60 − £2·30 = £2·30
230p − 92p = 138p
138p ÷ 2 = 69p

69p (A1)

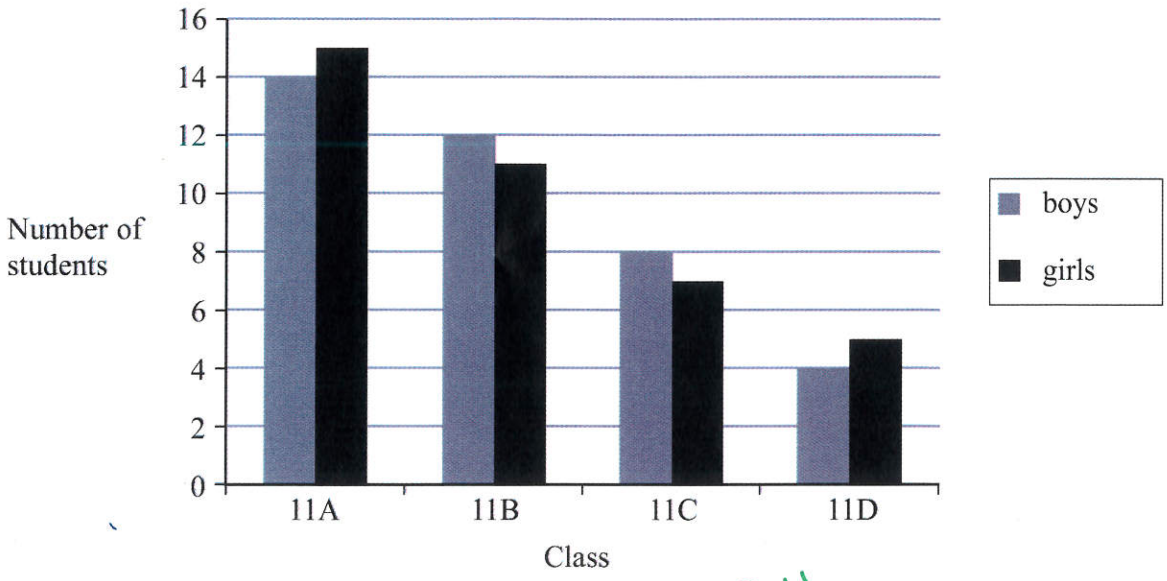
(P1) for complete process

(Total for Question 5 is 3 marks)

OR £0·69

NO units ⇒ NOT full marks.

6 The bar chart gives information about the numbers of students in the four Year 11 classes at Trowton School.



(a) What fraction of the students in class 11A are girls?

No. of boys = 14
No. of girls = 15
14 + 15 = 29

(M1)

15/29 (A1)

(2)

Shola says, Method mark for 15 seen as numerator or 29 seen as numerator

"There are more boys than girls in Year 11 in Trowton School."

(b) Is Shola correct?
You must give a reason for your answer.

No. of boys = 14 + 12 + 8 + 4 = 38
No. of girls = 15 + 11 + 7 + 5 = 38

} M1

Shola is NOT correct. There are the same number of boys as girls.

C1 ⇒ reason must be given

(2)

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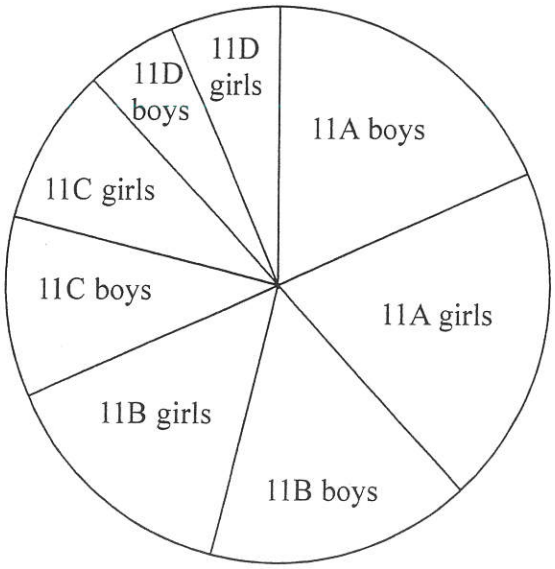
The pie chart gives information about the 76 students in the same four Year 11 classes at Trowton School.

Number of students in Year 11 of Trowton School



MW 128

Tolu says,

"It is more difficult to find out the numbers of students in each class from the pie chart than from the bar chart."

(c) Is Tolu correct?
You must give a reason for your answer.

Yes, because you have to measure the angle, then do $\frac{x}{360} \times 76$ which is a tricky calculation to do!

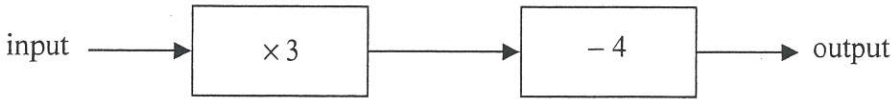
(1)

C1 with reason

(Total for Question 6 is 5 marks)

7 Here is a number machine.

MW 36



(a) Work out the **output** when the input is 4

4 × 3 = 12

12 − 4 = 8

8 (B1)

(1)

(b) Work out the **input** when the output is 11

11 + 4 = 15 (M1) ⇒ or use trial & error

15 ÷ 3 = 5

[check 5×3=15 15−4=11]

5 (A1)

(2)

(c) Show that there is a value of the input for which the input and the output have the same value.

Trial & error

4 → 8

5 → 11

3 → 5

2 → 4

(M1) for complete method

When the input is 2, the output is 2. (C1)

OR

x × 3 − 4 = x

3x − 4 = x

2x = 4 x = 2.

(2)

(Total for Question 7 is 5 marks)

can also get C1 if they say

3x − 4 = x

has a unique solution.

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8 1 yard is 36 inches.
10 cm is an approximation for 4 inches.

Work out an approximation for the number of cm in 2 yards.

1 yard ⇒ 36 inches } ×9 (M1)
10cm ⇒ 4 inches

so 90cm ⇒ 1 yard
so 180cm ⇒ 2 yards

(M1) for complete method

(A1) 180cm.

(Total for Question 8 is 3 marks)

9 Work out 234% of 150

MW 86

use your calculator.
Sometimes you can have percentages bigger than 100

(M1) $\frac{234}{100} \times 150$

(A1) 351

(Total for Question 9 is 2 marks)

10 Here are four numbers.

MW 85

0.43 $\quad \frac{3}{7} \quad$ 43.8% $\quad \frac{7}{16}$

Write these numbers in order of size.
Start with the smallest number.

0·430 0·428.... 0·438 0·437.....

(M1) ⇒ converts all to either decimals or percentages

(A1) $\frac{3}{7}$, 0.43, $\frac{7}{16}$, 43·8%

(Total for Question 10 is 2 marks)

MW 28

11 Here is a list of five numbers.

14 15 16 17 18

From the list,

(i) write down the prime number,

17 (B1)

(ii) write down the square number.

Even if you are not sure, have a guess ⇒ you might get it correct, and they don't give minus marks if you get it wrong!

16 (B1)

4×4 = 16

(Total for Question 11 is 2 marks)

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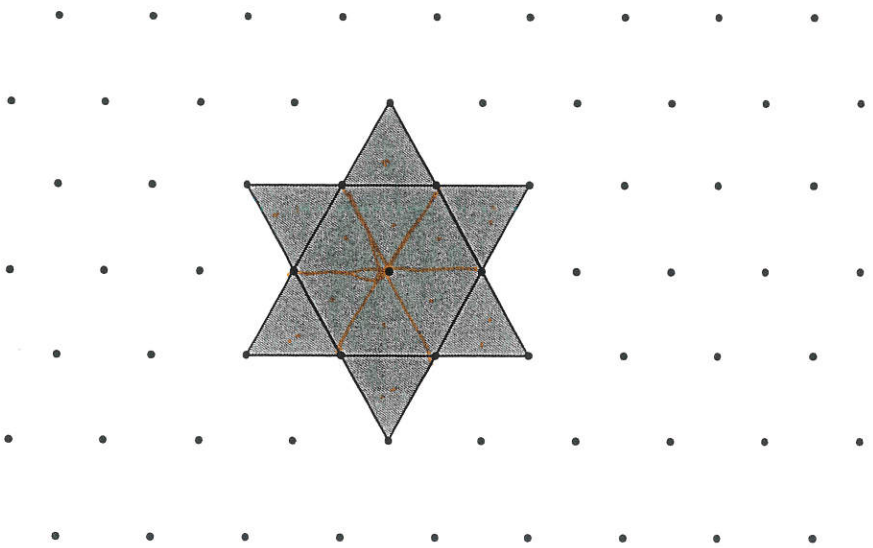
12 Here is a star shape.



The star shape is made from a regular hexagon and six congruent equilateral triangles.

The area of the star shape is 96 cm^2.

Work out the area of the regular hexagon.

Made up of 12 triangles
6 inside the hexagon (P1)

So half of 96

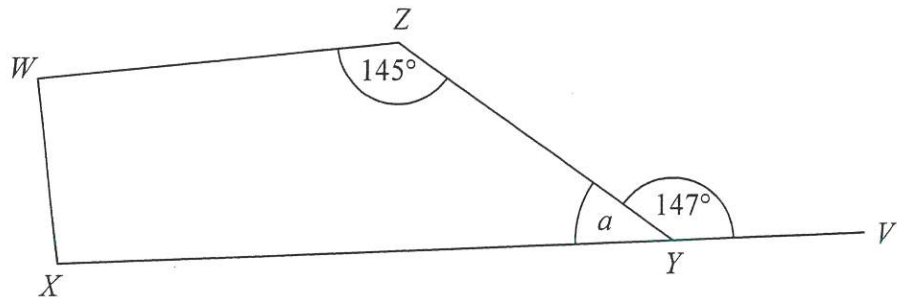
OR area of each triangle (OR P1)
= 96 ÷ 12 = 8.
Then 6 × 8

(A1) cao
48 cm^2

(Total for Question 12 is 2 marks)

MW45

13



WXYZ is a quadrilateral.
XYV is a straight line.

use your calculator!

(a) (i) Find the size of the angle marked *a*.

180 − 147

B1 33 °

(ii) Give a reason for your answer.

Angles on a straight line at a point add up to 180°

B1

(2)

Angle *ZWX* = angle *WXY*

(b) Work out the size of angle *ZWX*.

145 + 33 = 178
360 − 178 = 182
182 ÷ 2 = 91

P1 All needed for P1

A1 91 °

(2)

(Total for Question 13 is 4 marks)

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14 The total weight of 3 tins of beans and 4 jars of jam is 2080 g.
The total weight of 5 tins of beans is 2000 g.

Work out the weight of 1 tin of beans and the weight of 1 jar of jam.

5 tins ⇒ 2000g ↓ ÷5
1 tin ⇒ 400g (B1)
3 tins ⇒ 1200g } (P1)
2080 − 1200 = 880
4 jars ⇒ 880g ↓ ÷4 } (P1)
1 jar ⇒ 220g

tin of beans 400 g

jar of jam 220 (A1) g

(Total for Question 14 is 4 marks)

MW59 & MW72

15 There are 25 boys and 32 girls in a club.

$\frac{2}{5}$ of the boys and $\frac{1}{2}$ of the girls walk to the club.

The club leader picks at random a child from the children who walk to the club.

Work out the probability that this child is a boy.

P1 $\frac{2}{5}$ of 25 $= \frac{2}{5} \times 25 = 10$ boys walk

$\frac{1}{2}$ of 32 $= \frac{1}{2} \times 32 = 16$ girls walk

$10 + 16 = 26$ children walk

P1 complete process to find probability

o.e. A1 $\frac{10}{26} = \frac{5}{13}$

(Total for Question 15 is 3 marks)

$\frac{10}{26}$ or equivalent

[if they have written $\frac{10}{26}$ & tried to simplify it but done so incorrectly, you still award the accuracy mark.]

✗ Note the importance of showing workings out

$\frac{10}{26} = \frac{5}{14}$ gets full marks

$\frac{5}{14}$ [without $\frac{10}{26}$ does NOT get the marks.]

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16 Change 72 km/h into m/s.

72 km = 72 000 m

M1 72000 metres in 1 hour ÷ 60

M1 { 1200 metres in 1 min ÷ 60
20 metres in 1 sec

20 m/s
c.a.o.

Usain Bolt runs at just over half this speed!

A1

(Total for Question 16 is 3 marks)

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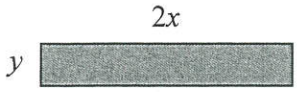
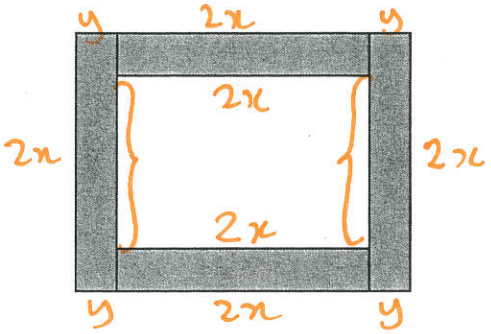
MW 137

17 Here is a rectangle made of card.



The measurements in the diagram are in centimetres.

Lily fits four of these rectangles together to make a frame.



annotate your diagram to help you!

The perimeter of the inside of the frame is P cm.

(a) Show that $P = 8x - 4y$

the width is $2x - y - y = 2x - 2y$ M1

$P = 2x + (2x - 2y) + 2x + (2x - 2y)$ C1

$P = 8x - 4y$

answer is given, so workings must be shown.

(2)

Magda says,

"When x and y are whole numbers, P is always a multiple of 4."

(b) Is Magda correct?
You must give a reason for your answer.

Yes.

$8x - 4y = 4(2x - y)$ M1

If x & y are whole numbers, then so is $2x - y$

so $4(2x - y)$ is a multiple of 4 C1

(2)

(Total for Question 17 is 4 marks)

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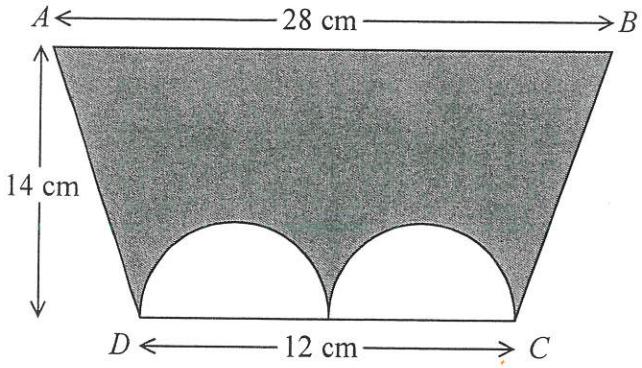
MW 117

18 The diagram shows a trapezium $ABCD$ and two identical semicircles.



The centre of each semicircle is on DC.

Work out the area of the shaded region.
Give your answer correct to 3 significant figures.

Formulae needed:

$A = \pi \times r^2$

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

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

$= \frac{1}{2} \times (12+28) \times 14$

$= \frac{1}{2} \times 40 \times 14$

$= 280$

Diameter of one semicircle $= 12 \div 2 = 6$ cm

So radius is 3 cm ⇒ (P1)

Two semicircles make a circle

$A = \pi \times 3^2$

$A = 9\pi = 28.274$

Area $= 280 - 28.274 = 251.72..$

(M1) for area of trapezium or circle or semicircle

(A1)

252 ..... cm^2

(Total for Question 18 is 4 marks)

(P1) process to find shaded area

Allow any answer 251.7 → 252 inclusive

(251 only gets 3 marks)

[no marks lost for not giving to 3 sig figs]

MW 105

Always have a go. With exchange it is either × or ÷

19 Asif is going on holiday to Turkey.

The exchange rate is £1 = 3.5601 lira.

Asif changes £550 to lira.

(a) Work out how many lira he should get.
Give your answer to the nearest lira.

550 × 3.5601
= 1958.055 (M1)

(A1)

1958 lira

(2)

Asif sees a pair of shoes in Turkey.
The shoes cost 210 lira.

Asif does not have a calculator.
He uses £2 = 7 lira to work out the approximate cost of the shoes in pounds.

(b) Use £2 = 7 lira to show that the approximate cost of the shoes is £60

210 ÷ 7 = 30 ↓ × 30 (M1)

7 lira = £2
210 lira = £60

(C1) with correct calculation.

(2)

(c) Is using £2 = 7 lira instead of using £1 = 3.5601 lira a sensible start to Asif's method to work out the cost of the shoes in pounds?

You must give a reason for your answer.

Yes because 3.5601 is close to 3.5 which is 3½. If we double this we get 7 lira. Dividing 210 by 7 is easy because 3 × 7 = 21. (C1)

(1)

(Total for Question 19 is 5 marks)

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MW 141

20 Here are the first six terms of a Fibonacci sequence.

1 1 2 3 5 8 13, 21, 34

The rule to continue a Fibonacci sequence is,

the next term in the sequence is the sum of the two previous terms.

(a) Find the 9th term of this sequence.

5+8 = 13
8+13 = 21
13+21 = 34

B1 cao

34

(1)

The first three terms of a different Fibonacci sequence are

a b $a+b$ a+2b, 2a+3b,

(b) Show that the 6th term of this sequence is $3a + 5b$

4th term is b + (a+b) = a+2b
5th term is (a+b) + (a+2b) = 2a+3b
6th term is (a+2b) + (2a+3b) = 3a+5b

M1 C1

(2)

Given that the 3rd term is 7 and the 6th term is 29,

(c) find the value of a and the value of b.

3rd term a+b = 7 (1) ×3
6th term 3a+5b = 29 (2)
3a+3b = 21 (3)

P1 ⇒ set up two equations
P1 ⇒ solve both equations

Signs the same subtract (2) − (3)

2b = 8
b = 4.

in (1) a+4 = 7
a = 3.

check in (2) 9 + 20 = 29.

$a =$ 3
$b =$ 4

A1

(3)

(Total for Question 20 is 6 marks)

Sequence is 3, 4, 7, 11, 18, 29 ✓

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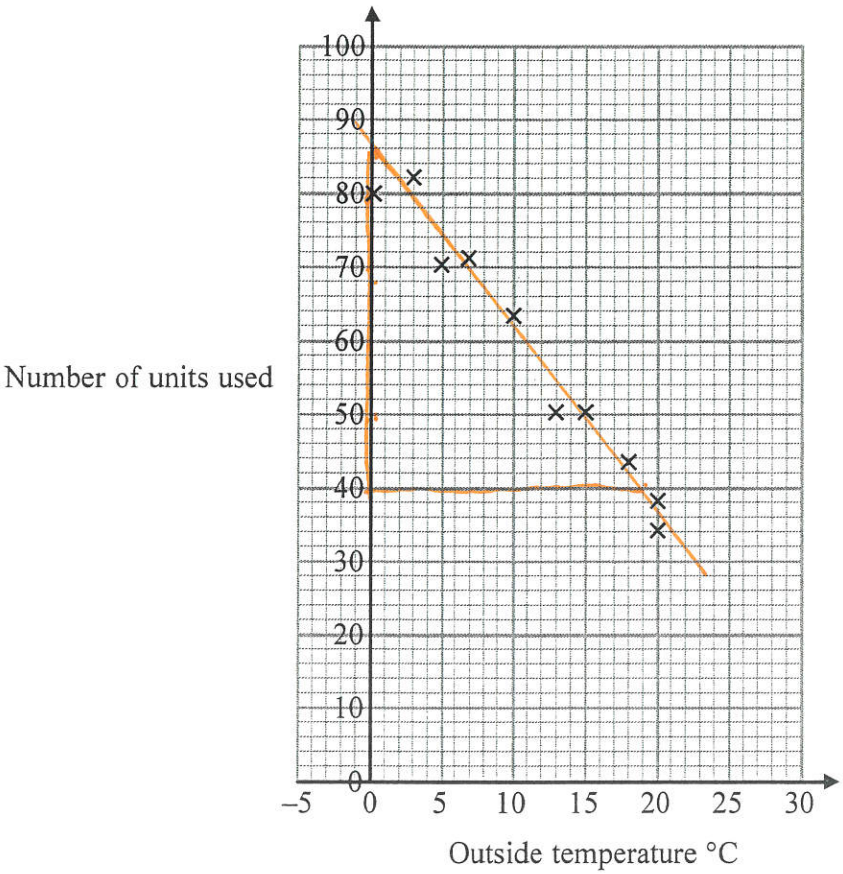
MN129

21 In a survey, the outside temperature and the number of units of electricity used for heating were recorded for ten homes.

The scatter diagram shows this information.



Always do this!

M1 ⇒ draws line of best fit.

Molly says,

"On average the number of units of electricity used for heating decreases by 4 units for each °C increase in outside temperature."

(a) Is Molly right?
Show how you get your answer.

M1 ⇒ gradient.

C1 gradient ± 2 → 3 & "no"

Gradient = $\frac{-46}{19} = -2.42$

No, it decreases by 2.42 for each °C increase.

(3)

(b) You should **not** use a line of best fit to predict the number of units of electricity used for heating when the outside temperature is 30 °C.

Give one reason why.

C1

The last crosses are at 20°C so the line of best fit stops here. When it gets hot people will use fans or air conditioning.

(1)

(Total for Question 21 is 4 marks)

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MW 22b

22 Henry is thinking of having a water meter.

These are the two ways he can pay for the water he uses.

Water Meter	No Water Meter
A charge of £28.20 per year **plus** 91.22p for every cubic metre of water used 1 cubic metre = 1000 litres	A charge of £107 per year

Henry uses an average of 180 litres of water each day.

Use this information to determine whether or not Henry should have a water meter.

180 litres in 1 day

1 year = 365 days

x 365 → 65700 ℓ in 1 year (P1)

÷ 1000 → 65.7 cubic metres in 1 year (P1)

cost: 65.7 x 91.22p = 5993.154 pence

⇒ 5993 pence

÷ 100 ⇒ £59.93 (P1)

add on his yearly charge

£59.93 + £28.20 = £88.13 ⇒ (P1) with units

Yes because it will ~~save~~ save him £18.87.

(A1) correct decision with correct figure.

(Total for Question 22 is 5 marks)

MW 109

23 A and B are two companies.

The table shows some information about the sales of each company and the number of workers for each company in 2004 and in 2014

	Company A		Company B	
	Sales (£ millions)	Number of workers	Sales (£ millions)	Number of workers
2004	320	2960	48	605
2014	388	3200	57	640

(a) Work out the percentage increase in sales from 2004 to 2014 for Company A.

increase = 388 − 320 = 68

% increase = $\frac{68}{320} \times 100$ = (M1) complete method

divide by the original

(A1) 21·25 %

(2)

(b) Which company had the most sales per worker in 2014, Company A or Company B?
You must show how you get your answer.

Sales ÷ worker

Company A ⇒ 388 ÷ 3200 = 0·12125 (A1)

Company B ⇒ 57 ÷ 640 = 0·0890

(M1) sales/person for A or B

only need 1 correct

so Company A.

Can do £388 000 000 ÷ 3200 = £121 250
£ 57 000 000 ÷ 640 = £ 89 062·50

(3)

(Total for Question 23 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS

Company A with 0·12125 & 0·0890 . . .

(A1) or £121 250 & £89 062·50

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