

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic – Mark Scheme

Statistics

Plotting and interpreting scatter graphs

v1.0

Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

If a student uses a method which is not explicitly covered by the mark scheme the same principles of marking should be applied. Credit should be given to any valid methods. Examiners should seek advice from their senior examiner if in any doubt

M	Method marks are awarded for a correct method which could lead to a correct answer.
A	Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied
B	Marks awarded independent of method.
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
SC	Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
M dep	A method mark dependent on a previous method mark being awarded.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
oe	Or equivalent. Accept answers that are equivalent. e.g. accept 0.5 as well as $\frac{1}{2}$
[a, b]	Accept values between a and b inclusive.
3.14...	Allow answers which begin 3.14 e.g. 3.14, 3.142, 3.1416
Use of brackets	It is not necessary to see the bracketed work to award the marks.

Examiners should consistently apply the following principles

Diagrams

Diagrams that have working on them should be treated like normal responses. If a diagram has been written on but the correct response is within the answer space, the work within the answer space should be marked. Working on diagrams that contradicts work within the answer space is not to be considered as choice but as working, and is not, therefore, penalised.

Responses which appear to come from incorrect methods

Whenever there is doubt as to whether a student has used an incorrect method to obtain an answer, as a general principle, the benefit of doubt must be given to the student. In cases where there is no doubt that the answer has come from incorrect working then the student should be penalised.

Questions which ask students to show working

Instructions on marking will be given but usually marks are not awarded to students who show no working.

Questions which do not ask students to show working

As a general principle, a correct response is awarded full marks.

Misread or miscopy

Students often copy values from a question incorrectly. If the examiner thinks that the student has made a genuine misread, then only the accuracy marks (A or B marks), up to a maximum of 2 marks are penalised. The method marks can still be awarded.

Further work

Once the correct answer has been seen, further working may be ignored unless it goes on to contradict the correct answer.

Choice

When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.

Work not replaced

Erased or crossed out work that is still legible should be marked.

Work replaced

Erased or crossed out work that has been replaced is not awarded marks.

Premature approximation

Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

Q1.

- (a) Points plotted correctly

$B1$ if 4 or 5 plotted correctly $\pm \frac{1}{2}$ small square

B2

- (b) Mark or LOBF on graph within range (25, 40) to (25, 44)

M1

40 – 44

ft their line or their mark

SC1 if no marks or no LOBF shown and answer in range [40, 44]

A1ft**Alternative method**

Any attempt at interpolation or ‘build up’

*Shows sales **and** temperature for two points either side of 25, eg one of (20, 36) or (21, 37) or (22, 39) and (29, 47) or a calculation such as $39 + 3 \times (47 - 39) \div 7$*

M1

40 – 44

SC1 if the ‘interpolation’ is not convincing but answer in range [40, 44]

A1ft

- (c) No as the sales at low temperatures are constant

No as at 9° sales are (about) same

At low temperatures sales do not increase

B1**[5]****Q2.**

This question has been adapted to better suit the style of the current specification

- (a) 9.5

oe

B1

- (b) Remaining 5 points plotted correctly

$\pm \frac{1}{2}$ square tolerance

B1 3 or 4 points plotted correctly

B2

- (c) Point identified at (10, 5)

B1

Valid reason

eg Not close to best fit line

Does not follow the trend

B1**[5]**

Q3.

This question has been adapted to better suit the style of the current specification

(a) strong positive

B1

(b) Straight ruled line of best fit

Through (30, 1) to (35, 1) and (60, 6) to (65, 6)

B1

4

B1

(c) Refers to danger when extrapolating outside the range of the data given
or

Refers to difficulty of interpolation at certain points

eg 35 lessons suggests 1 or 2 tests *oe*

eg line of best fit might not continue

eg 20 lessons suggests 0 tests

B1

[4]

Q4.

Graph A Strong negative

B1

Graph B No correlation

allow 'No' or 'None'

B1

Additional Guidance

Condone incorrect spelling if intention is clear

Allow clear link(s) from the table to the answer line

eg an arrow from 'Strong negative' to the Graph A answer line

[2]

Q5.

(a) Valid description

eg

as downloads increase, so do CD sales

downloads are about $\left[1\frac{1}{3}, 2\right]$ times as many as CDs

CDs are about $\left[\frac{1}{2}, \frac{3}{4}\right]$ as many as downloads

B1

Additional Guidance

Ignore 'Positive correlation'

Condone references to causality

eg an increase in downloads causes an increase in CDs sold

B1

As one goes up the other goes up / Both go up at a similar rate

B1

They both go up

B0

Downloads are always more than CDs

B0

They are in direct proportion

B0

The relationship is linear

B0

(b) **Alternative method 1: reading from the graph**

$2.5(0) \times 9000$ or 22 500

or

[5300, 5500]

oe

$2.5(0)$ may be 2 or 3

[5300, 5500] may be 5000

M1

$2.5(0) \times 9000 + 3 \times [5300, 5500]$

or

22 500 + [15 900, 16 500]

oe

$2.5(0)$ may be 2 or 3

[5300, 5500] may be 5000

M1dep

[38 400, 39 000]

ft 2 or 3 for $2.5(0)$ and/or 5000 for [5300, 5500]

A1ft

Alternative method 2: using a multiplier

$2.5(0) \times 9000$ or 22 500

or

$9000 \times [0.5, 0.75]$

oe

$2.5(0)$ may be 2 or 3

M1

$2.5(0) \times 9000 + 3 \times 9000 \times [0.5, 0.75]$

oe

$2.5(0)$ may be 2 or 3

M1dep

[36 000, 42 750]

with $9000 \times [0.5, 0.75]$ seen

ft 2 or 3 for $2.5(0)$

A1ft

Additional Guidance

Check graph for working

Working may be in pence, units not required for up to M2

Final answer in pence must have units to award A1

[4]

Q6.

This question has been adapted to better suit the style of the current specification

(a) $\frac{3}{10}$ or 0.3 or 30%

B1

(b) (strong) positive

B1

(c) Straight ruled line of best fit

Through (30, 1) to (35, 1)

and (60, 6) to (65, 6)

B1

4

B1

- (d) Refers to danger when extrapolating outside the range of the data given
or
Refers to difficulty of interpolation at certain points
eg 35 lessons suggests 1 or 2 tests
oe
eg line of best fit might not continue
eg 20 lessons suggests 0 tests

B1

[5]

Q7.

- (a) LOBF drawn. Must be a straight line between (15, [110, 120]) to (25, [150, 170])

M1

Value read from LOBF at $h = 145$, may be rounded or truncated to nearest integer

ft their line $\pm \frac{1}{2}$ square

SC1 answer in range [21, 23] with M0 scored

A1ft

- (b) Complete answer
Correct substitution
Correct evaluation and conclusion

Person	Length	Value (calculated, stated)	Conclusion
A	11	104 (108)	No
B	25	160 (160)	Yes
C	18	132 (140)	No
D	28	172 (180)	No
E	15	120 (120)	Yes
F	21	144 (140)	No
G	17	128 (118)	No
H	26	164 (164)	Yes
I	13	112 (100)	No
J	24	156 (150)	No

or $h = 4f + 60$ drawn and correct conclusion eg B is OK because on line

B1 for correct substitution with incorrect evaluation and correct conclusion for their value

B1 for correct substitution with partial evaluation and correct conclusion for their value if it had been evaluated

B1 for correct substitution with correct evaluation and incorrect conclusion for their value

B1 if $h = 4f + 60$ drawn

B2

[4]

Q8.

(a) Strong positive

B1

(b) Straight line of best fit passing through (5, [18k, 24k])
and (23, [42k, 48k])

*mark intention of straight line
ignore anything beyond gates*

B1

Correct reading $\pm \frac{1}{2}$ square for their straight line of best fit
*ft their straight line with positive gradient
ignore any working lines on the graph
condone thousands missing
may be implied by correct number of lives for their line*

B1ft

Correct evaluation of their answer in thousands divided by 2000
*ft their reading from straight line but must be in thousands
condone half a life (or rounded or truncated) if reading is an
odd number of thousands*

B1ft

Additional Guidance

(their correct line of best fit would give a reading of 34 000)

Answer 17

B1B1B1

Answer 0.017

B1B1B0

(Points =) 33 000, answer 16 (within half a square, answer truncated)

B1B0B1

(Points =) 32 000, answer 16

B1B0B1ft

For two lines of best fit with no answer, take as choice

[4]

Q9.

- (a) Higher temperature lower soup sales
Lower temp more soup sold

B1

Additional Guidance

Less soup when warm

B1

Sales go down as temperature goes up

B1

Sell more soup when it is cold

B1

As temperature gets higher the soup gets lower

B1

The hotter the day is the less people want soup because it is hot

B1

The hotter the temperature the less likely someone is going to buy soup

B1

When more soup is sold the weather gets colder

B0

Soup sales depend on temperature

B0

Negative correlation

B0

As the temperature decreases the monthly sales of soup decreases

B0

As the soup gets hotter the sales go down

B0

The lower the average the more sales of soup

B0

It decreases as monthly temperature increases

B0

- (b) **Alternative method 1**

Straight line of best fit drawn

Line of best fit must be long enough to go between $[(4, 460), (4, 600)]$ and $[(22.5, 120), (25, 180)]$

M1

470

ft their line if M1 awarded ($\pm \frac{1}{2}$ small square accuracy)

Must be read from 7 ($\pm \frac{1}{2}$ small square)

SC1 no LOBF or wrong LOBF and answer in range $[420, 540]$. If point shown must be at 7 ($\pm \frac{1}{2}$ small square)

A1ft

Alternative method 2

Chooses $(4, 560)$ and any other point (x_1, y_1) or $(10, 390)$

Calculates $560 - 3 \times \frac{(560 - y_1)}{x_1 - 4}$

or $y_1 + \frac{(x_1 - 7)(560 - y_1)}{(x_1 - 4)}$

M1

Correct answer for their chosen value
 (10, 390) gives 475
 Value given to 3 sf at least

8.5	480	507	!
9.5	380	462	!
10.5	400	486	!
11.5	360	480	!
13.5	300	478	!
15	360	505	!
16.5	260	488	!
19	300	508	!
21.5	240	505	!
22.5	120	489	!
25	180	506	!

SC1 interpolation does not score M1 but answer in range [420, 540]

A1

Additional Guidance

(4, 560) to (10, 390)

$(4 + 10) \div 2 = 7$

$(560 + 390) \div 2 = 475$

M1, A1

(4, 560) to (8.5, 480)

$480 + (1.5 \div 4.5) \times (560 - 480)$

506.66

M1, A1

Line of best fit in range and answer in range but read from 7.5

M1, A0

[3]

Q10.

- (a) All 6 points correct ($\pm \frac{1}{2}$ sq)
4 or 5 points correct B1 Ignore extras

B2

- (b) Draws a suitable line of best fit

M1

*Answer appropriate to their line of best fit
 ft their plots and appropriate line
 Must be integer answer
 SC1 8 or 9 or 10*

A1 ft

- (c) Cannot tell

B1

[5]

Q11.

- (a) 5 points plotted correctly
 $\frac{1}{2}$
*Allow $\pm \frac{1}{2}$ square
 B1 for 3 or 4 correct plots*

B2

- (b) One straight line through both gates (90, 8.5-9.5) and (130, 13-14)

B1

- (c) 11.3 *ft their straight line of best fit
 Allow [11.0, 11.6] if B0 awarded in (b)*

B1 ft

[4]

Q12.

B

B1

[1]

Q13.

(a) Negative

Ignore any other description

Accept eg strong negative, weak negative

B1

(b) [118,122]

B1

[2]

Q14.

(a) $\frac{2}{13}$

B1

(b) 5.4 minutes

oe 60 ÷ 5 (= 12)

M1

5 (minutes) 24 (seconds)

SC1 any other non-integer time correctly converted to minutes and seconds

SC1 5 min 4 secs or 5 min 40 secs

or in range 5 min 12 secs

to 5 min 36 secs

A1

(c) There is some (weak or moderate) support for the hypothesis

oe Do not allow strong support oe

B1

(d) At least 5 points with all in a strong positive correlation

B1

[5]

Q15.

(a) 34

B1

(b) (5.10+) 2 hours 1 minute

Accept sight of 2 hours 1 minute or 2.01

M1

7.11

A1

(c) 4 correct plots

B1 ft 2 or 3 correct plots ft their part a

B2 ft

(d) Draws a suitable line of best fit

M1

(5.10+) their read off value at 5.10

M1 dep

Correct answer for their 5.10 + read off value

Must have M2

SC1 M0 but answer [5.40, 5.45]

A1 ft

[8]

Q16.

(a) A

B1

(b) B and says there is no correlation
oe

B1

[2]

Q17.

(a) Distance (km)

oe

must have units

B1

(8, 38) and (8.5, 42) plotted

$\pm \frac{1}{2}$ square

B1

Additional Guidance

Ignore any lines

Ignore other plots

(b) Positive

oe

B1

Strong

oe eg fairly strong

SC1 answers in reverse order

B1

[4]

Q18.

- (a) Correct criticisms about any two of
the incorrect plotting of (17, 80) at (17,60)
B1 for one correct comment about point, position or length
the incorrect position of the line of best fit
Allow reference to a better line of best fit drawn e.g. The line should look like minet
the incorrect length of the line of best fit (outside the range of the data)

B2**Additional Guidance****A comment about the incorrect point must refer to the specific point**

One of the points is wrong and point at (17, 60) circled on graph

B1

Not plotted (17, 80) correctly

B1

x on 60 should be on 80

B1

Point at 60 is wrong

B1

Day 3 is wrong / there is no day 3 on the graph

B1

17 is plotted at 60 / 17 should be plotted at 80

B1

One of the points is wrong

B0

Points on the graph don't match the table

B0

Not put all the points in the correct place

B0**A comment about the line of best fit must not have any misconception**

The line is not steep enough / at wrong angle/ should be more vertical

B1

The line isn't a line of best fit/ the line doesn't fit the points

B1

The line of best fit goes below 17 / condone past 30 (implies outside range)

B1

The line of best fit is wrong / not drawn accurately/ not drawn properly

B0

It isn't a line of best fit because it doesn't start at 0

B0

The line of best fit is wrong it should go through (0, 0)

B0

The line of best fit doesn't go through the points

B0

The line is wrong it only goes through one cross

B0

The line of best fit doesn't go to the axis (implies it's too short)

B0

(b) Ticks No

Allow any unambiguous indication of No, if boxes blank may be in the reason

and explanation that it should be the highest value – the lowest value
oe eg No, it should be the hottest – the coldest

B1

Additional Guidance

Does not tick or say No

B0

Ticks No and It should be $30 - 17$

B1

Ticks No and It should be 13

B1

Ticks No and He hasn't subtracted the lowest value

B1

Ticks No and It should be $17 - 30 = 13$

B1

Ticks No and Range = biggest – smallest

B1

Ticks No and The lowest temperature is 17 not 20

B1

Ticks No and He hasn't used the lowest temperature

B1

Ticks No and The lowest temperature is not 20

B1

Ticks No and The lowest temperature is 17

B1

Ticks No and The numbers range from 17 to 30

B1

Ticks No and It should be $30 - 17 = 23$

B0

Ticks No and It should be $17 - 30$

B0

Ticks No and You should take the smallest from the largest $30 - 26$

B0

Ticks No and You should take the smallest from the largest $180 - 17$

B0

Ticks No and It should be the smallest – the largest

B0

Ticks Yes and It should be the highest value – the lowest value

B0

(c) Alternative method 1	
180 + 150 + 80 + 130 + 120 or 660	M1
their 660 × 0.15 or 99 or their 660 × 0.85 or 561 oe	M1dep
7 × 5 or 35	M1
their 660 – their 99 – their 35 or their 561 – their 35 <i>Dep on M1M1M1</i>	M1dep
526(.00) <i>SC4 509</i>	A1
Alternative method 2	
180 × 0.15 or 27 and 150 × 0.15 or 22.5(0) and 80 × 0.15 or 12 and 130 × 0.15 or 19.5(0) and 120 × 0.15 or 18 oe	M1
their 27 + their 22.5(0) + their 12 + their 19.5(0) + their 18 or 99	M1dep
7 × 5 or 35	M1
180 + 150 + 80 + 130 + 120 – their 99 – their 35 <i>Dep on M1M1M1</i>	M1dep
526(.00) <i>SC4 509</i>	A1
Alternative method 3	
180 × 0.15 or 27 and 150 × 0.15 or 22.5(0) and 80 × 0.15 or 12 and 130 × 0.15 or 19.5(0) and 120 × 0.15 or 18 oe	M1
180 – their 27 or 153 and 150 – their 22.5(0) or 127.5(0) and 80 – their 12 or 68 and 130 – their 19.5(0) or 110.5(0) and 120 – their 18 or 102 <i>Working out 85% of all five sales scores M1M1dep</i>	M1dep

7×5 or 35
 or their $153 - 7$ or 146
Subtracting five 7s
 and their $127.5(0) - 7$ or $120.5(0)$
 and their $68 - 7$ or 61
 and their $110.5(0) - 7$ or $103.5(0)$
 and their $102 - 7$ or 95

M1

their $153 +$ their $127.5(0) +$ their $68 +$ their $110.5(0) +$ their $102 -$ their 35
 or their $146 +$ their $120.5(0) +$ their $61 +$ their $103.5(0) +$ their 95
Dep on M1M1M1

M1dep

526(.00)
SC4 509

A1

Alternative method 4

180×0.15 or 27
 and 150×0.15 or $22.5(0)$
 and 80×0.15 or 12
 and 130×0.15 or $19.5(0)$
 and 120×0.15 or 18
 oe

M1

their $27 + 7$ or 34
 and their $22.5(0) + 7$ or $29.5(0)$
 and their $12 + 7$ or 19
 and their $19.5(0) + 7$ or $26.5(0)$
 and their $18 + 7$ or 25
Adding five 7s

M1

their $34 +$ their $29.5(0) +$ their $19 +$ their $26.5(0) +$ their 25 or 134
 or $180 -$ their 34 or 146
 and $150 -$ their $29.5(0)$ or $120.5(0)$
 and $80 -$ their 19 or 61
 and $130 -$ their $26.5(0)$ or $103.5(0)$
 and $120 -$ their 25 or 95
Dep on M1M1

M1dep

$180 + 150 + 80 + 130 + 120 -$ their 134
 or their $146 +$ their $120.5(0) +$ their $61 +$ their $103.5(0) +$ their 95
Dep on M1M1M1

M1dep

526(.00)
SC4 509

A1

Additional Guidance

509 comes from using 60 from the incorrect point on the scatter graph

SC4

Use the scheme that awards the best mark

35

M1

99

M1M1dep

134

M1M1M1dep

$660 - 35 = 625$ $0.15 \times 625 = 93.75$

M1M0M1

Answer 93.75

M0A0

Build up method for 15% must be correct or method shown for incorrect parts

e.g. 10% of 660 = 60, 5% = 30, 15% = 90

M1M0dep

e.g. 10% of 660 = $660 \div 10 = 60$, 5% = 30, 15% = 90

M1M1dep**[8]****Q19.**

(a) Positive

accept +ve or +

B1**Additional Guidance**

Ignore any reference to the strength of the correlation

As one jump increases so does the other so positive

B1

As one jump increases so does the other

B0

(b) Straight line of best fit passing through

(150, [504, 512])

and

(180, [550, 558])

accept if clear intention to draw a straight line

ignore anything either side of the gates

B1

Correct reading $\pm \frac{1}{2}$ square for their straight line of best fit

ft straight line with positive gradient

accept if clear intention to draw a straight line

ignore any working lines on the graph

B1ft**Additional Guidance**

No line of best fit

B0B0ft

Short straight line with positive gradient and correct reading $\frac{1}{2}$ square for their line

B0B1ft

Two lines of best fit, mark the line that leads to their answer

Two lines of best fit, no answer, apply the usual rules of choice

(c) Valid reason

*eg 195 cm is outside the range of values
or cannot extrapolate*

B1

Additional Guidance

Allow '195' or 'his jump' or 'it' to represent 195 cm

B1 responses - do **not** allow points/data/plots/results to be replaced by graph or line

195 exceeds the data

B1

It is beyond/outside the data

B1

195 is higher than 185

B1

Nobody else jumped that high

B1

His jump is more than the others

B1

The correlation stops at 560

B1

All the other points/data/plots/results are less than 195

B1

The points/data/plots/results don't reach 195

B1

The points/data/plots/results don't reach that far

B1

The points/data/plots/results stop at 185

B1

The pattern/trend/correlation may change after the points/data/plots/results

B1

The pattern/trend/correlation may change

B0

It doesn't fit the pattern/trend/correlation

B0

Line is not long enough

B0

No points at/near/around/close to 195

B0

195 is anomalous or 195 is an outlier

B0

Not enough data

B0

This data is not on the graph

B0

It is too different to the other points

B0

Ignore extra statements that do not contradict a valid reason

[4]

Q20.

D

B1

[1]

Q21.

- (a) 40
- (b) Circles the outlier (58, 14)
- (c) Links middle graph to strong positive correlation
Links bottom graph to little or no correlation
B1 for each

B1**B1****B2****[4]****Q22.**

- (a) All 3 points correctly plotted
 $\pm \frac{1}{2} sq$ *Ignore extras*
- (b) Negative correlation
or
As the time spent learning words increased, the number of incorrect words decreased
oe
- (c) Line of best fit drawn
Between (3, 5) to (3, 6) to between (7, 1) and (7, 3)
And at least from 3 to 7 horizontally
- 4
ft a correct lobf
Accept integer answers only
SC1 for 3 or 4 if no lobf or incorrect lobf
- (d) No line of best fit may change
or No Line of best fit cannot continue in the same way (becomes negative)
Not possible to be sure mistake is not made in test/pressure of test/human error/different individuals
Cannot say as 12 is beyond the range of the data
oe

B1**B1****M1****A1****B1****[5]****Q23.**

- (a) 2
- (b) Four points plotted correctly
 $\frac{1}{2}$ *square tolerance*
B1 for 2 or 3 points plotted correctly
- (c) Straight ruled line of best fit correctly drawn within tolerance

B1**B2****B1**

- (d) Correct reading off for their line of best fit

$\pm \frac{1}{2}$ square tolerance

ft their line of best fit

Accept [32, 42] if no line of best fit seen

B1ft

[5]

Q24.

- (a) All 4 points correctly plotted

$\pm \frac{1}{2}$ square. Ignore extras

B2

- (b) Positive

B1

- (c) Line of best fit drawn or reading indicated on graph

M1

'8.80'

ft their straight, increasing lobf

SC1 for 7.80 to 9 if no line or mark on graph.

A1ft

Alternative

$$\frac{8.00 + 9.80}{2}$$

oe Allow 7.20 or 7.60 instead of 8.00

M1

8.90

8.50 or 8.70

A1

- (d) Point (8,2) circled

M1

Not close to lobf/other data

Or other data all increase

oe Reason relating to trend

A1

[7]

Q25.

- (a) Any four correct plots

$\pm \frac{1}{2}$ square

M1

All seven correct plots

$\pm \frac{1}{2}$ square

A1

- (b) Continuous line within limits

Straight line, negative gradient, at least 3 large squares wide that passes / would pass through gate at (2, 8) and (2, 11) and gate at (5, 1) and (5, 5)

B1

- (c) Negative (correlation)
Strand (i) Correct vocabulary
Must use the word 'negative'
Ignore extra words eg strong, weak, ...

Q1

- (d) Reads across from 5 on the vertical axis
Must have a straight line of best fit

M1

Answer appropriate to their straight line of best fit with negative gradient

ft their line of best fit $\pm \frac{1}{2}$ square
SC1 Answer [3.9, 4.3]

A1 ft

[6]

Q26.

- (a) Positive

B1

Additional Guidance

Ignore descriptive words such as 'strong' or 'weak' or 'scattered'

- (b) Correct straight line which passes between (10, 35) and (10, 55) and between (70, 135) and (70, 155)

line must extend from 10 to 70

B1

Draws a vertical line from umbrella sales of £60 to meet their line or marks a point on their line of best fit corresponding to umbrella sales of £60

their line / curve must be increasing
may be implied by correct value for their line / curve

M1

Correct value for their line

ft their increasing line / curve
allow any reading within one vertical square
eg if their vertical line crosses their line of best fit in the first square above 125, allow [125, 130]

A1ft

Additional Guidance

No increasing line / curve drawn

B0M0A0

Mark intention for straight line for B1

The line may go through the coordinates of the gates but must not go above or below
 Ignore any parts of the line outside the range 10 to 70

[4]

Q27.

- (a) All four points plotted correctly
 (275, 125), (150, 190), (125, 225), (180, 175)
B1 for two or three correct plots

B2

- (b) Appropriate line of best fit

A straight line at least 4 squares wide which goes through, or would go through, the two gates (125, 175 – 225) and (275, 75 – 125)

B1

- (c) Correct reading from their graph
ft their negative, straight line of best fit
If B0 awarded in (b), accept answer in range [145, 150]

B1ft

Additional Guidance

Allow $\pm\frac{1}{2}$ square tolerance but condone rounding up to the next 5 or down to the previous 5

[4]

Q28.

- (a) Negative
ignore descriptive words eg strong

B1

Additional Guidance

Description of relationship only
 eg as the car gets older the value goes down

B0

- (b) 4000

B1

Additional Guidance

(3, 4000)

B0

- (c) [15 000, 15 400]

B1

- (d) 2012

B1

1

horizontal line at $5600 \pm \frac{1}{2}$ small square

or

[6.8, 7.2]

implied by mark in correct place on line or horizontal axis

B2

Additional Guidance

2012 and 7 on answer line

B2

[5]

Q29.

(a) Valid description

eg as height increases so does mass

or

as mass decreases so does height

B1

Additional Guidance

Ignore incorrect or irrelevant statements alongside correct statements,
unless contradictory

As one increases so does the other

B1

It is usually heavier the taller it is

B1

As height increases the weight increases

B1

They are directly proportional (condone)

B1

It is positive correlation because the taller the dogs the heavier the dogs

B1

The taller they are the more they weigh

B1

Taller dogs are heavier

B1

The tallest dogs have more mass than the shorter dogs

B1

The shortest dogs have a lower mass

B1

Mass and height both increase at the same time (condone)

B1

The height and mass of the dogs increase at the same rate (condone)

B1

A tall dog is heavy

B0

The bigger they are the more they weigh (height is not implied from bigger)

B0

It is heavier as it grows (height is not implied from growth)

B0

It is positive correlation

B0

- (b) Straight line passing through (36, [9,13]) and (62, [30, 34])
accept intention to draw a straight line
ignore anything outside (36, [9,13]) and (62, [30, 34])

B1

Correct reading $\pm \frac{1}{2}$ square for their straight line
ft their line with positive gradient
ignore any working lines on their graph

B1ft

Additional Guidance

No line of best fit

B0B0

Short straight line not passing through (36, [9,13]) and (62, [30, 34]) with
 positive gradient and correct reading $\pm \frac{1}{2}$ square for their line

B0B1ft

Two lines of best fit, mark the line that leads to their answer

Two lines of best fit, no answer, apply the usual rules of choice

[3]