

**GCSE
STATISTICS
8382/1F**

Foundation Tier Paper 1

Mark scheme

June 2024

Version: 1.0 Final



Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

No student should be disadvantaged on the basis of their gender identity and/or how they refer to the gender identity of others in their exam responses.

A consistent use of 'they/them' as a singular and pronouns beyond 'she/her' or 'he/him' will be credited in exam responses in line with existing mark scheme criteria.

Further copies of this mark scheme are available from aqa.org.uk

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Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Statistics 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 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. eg accept 0.5 as well as $\frac{1}{2}$
[a, b]	Accept values between a and b inclusive.
[a, b)	Accept values $a \leq \text{value} < b$
3.14...	Accept answers which begin 3.14 eg 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.

Continental notation

Accept a comma used instead of a decimal point (for example, in measurements or currency), provided that it is clear to the examiner that the student intended it to be a decimal point.

Q	Answer	Mark	Comments
1	12	B1	

Q	Answer	Mark	Comments
2	110%	B1	

Q	Answer	Mark	Comments
3	Stratification	B1	

Q	Answer	Mark	Comments
4	-0.4	B1	

Q	Answer	Mark	Comments
5a	Red and Green	B1	either order
	Additional Guidance		
	Accept any clear indication eg R and G		

Q	Answer	Mark	Comments
5b	Mark on $\frac{1}{6}$	B1	
	Additional Guidance		
	Accept any indication for an arrow		
	Condone a horizontal arrow/line from 0 to $\frac{1}{6}$		

Q	Answer	Mark	Comments
5c	Mark on zero	B1	
	Additional Guidance		
	Accept any indication for an arrow		

Q	Answer	Mark	Comments
5d	If there aren't equal numbers of each colour	B1	oe
	Additional Guidance		
	There might be a multiple of just one colour		B1
	There might be a multiple of one colour		B0
	We don't know the number of each colour		B1
	There might be more than one of each colour		B0
	We'd need to know the total number of each colour		B1
	We'd need to know the total number of each disc		B0
We'd need to know the total number of discs		B0	
There might be more than 5 discs		B0	

Q	Answer	Mark	Comments
6a	7	B1	oe

Q	Answer	Mark	Comments
6b	Wednesday	B1	
	Additional Guidance		
	Accept any clear indication eg Wed		

Q	Answer	Mark	Comments
6c	$23 + 8 + 19 + 10$	M1	oe
	60	A1	
	Additional Guidance		
	Working may be seen in table		

Q	Answer	Mark	Comments
6d	$\frac{8}{20}$	B2	oe B1 numerator 8 or denominator 20 or 40% or 0.4(0)
	Additional Guidance		
	A final answer equivalent to $\frac{8}{20}$ containing decimals		B1
	Working may be seen in table		
Ignore any attempt to simplify after correct answer seen			

Q	Answer	Mark	Comments
6e	There were fewer cars on Monday (compared to Saturday) or There were more cars on Saturday (compared to Monday)	B1	
	Additional Guidance		
	Any values quoted must be correct, eg		
	There were 18 more cars on Saturday		B1
	There were over 4 times as many cars on Saturday		B1
	There were 19 less cars on Monday		B0
	There were 4 times as many cars on Saturday		B0
	There were 23 cars on Saturday but only 5 on Monday		B1
There were 5 cars on Monday and 23 on Saturday		B0	
There are 18 more cars / There is a difference of 18 cars		B0	
5 : 23 or 23 : 5 with no accompanying correct statement		B0	

Q	Answer	Mark	Comments	
6f	Correct key	B1		
	Correct labels of Saturday and Sunday	B1		
	<ul style="list-style-type: none"> • Equal width bars • Consistent equal width gaps • All four sections correctly shaded • Saturday bar shows a 23, 8 split • Sunday bar shows a 19, 10 split 	B3ft	ft their key B2ft four bullet points satisfied B1ft three bullet points satisfied $\pm \frac{1}{2}$ small square	
	Additional Guidance			
	Accept any clear indication for labels, eg Sat and Sun, but not S and S			
	Condone an inconsistent order of shading			
	Mark intention			

Q	Answer	Mark	Comments	
6g	A correct statement concerning the limited time period, eg it is only for one hour per day or it is only for one week	B1	oe	
	A correct statement concerning the time of year, eg the data is for June (not December)	B1	oe	
	Additional Guidance			
	Ignore any non-contradictory or irrelevant statements			
	Both marks may be awarded in one statement, eg It was only for one week in June			B1B1
	Only one week			First B1
	There's not enough data (implies only one week / only one hour (per day))			First B1
	The road conditions are worse in December so people may not use their cars as much			Second B1
	There are less/more roadworks in December / less/more roadworks in June Due to roadworks			Second B1 Second B0
	The weather's not as good in December (so people may use their car less/more)			Second B1
	It's the holidays in December / It's the holidays in June It's the holidays so people may use their car more/less			Second B1 Second B0
	No correlation to December No correlation			Second B1 Second B0
	December may have more/less cars (than June)			Second B1
	It was random			B0
Every day is different			B0	

Q	Answer	Mark	Comments
7ai	Easier to interpret or read or Easier to work with	B1	oe
	Additional Guidance		
	The data does not need to be that accurate		B1
	Easier to process/understand/represent/plot/calculate Easier/Easy		B1 B0
	Less complicated numbers so easier to work with Less complicated numbers		B1 B0
	It's a good estimate		B0

Q	Answer	Mark	Comments
7aii	Loss of accuracy	B1	oe
	Additional Guidance		
	No longer accurate/exact/precise/specific		B1
	Takes time to do the rounding		B1
	Only an estimate / Makes data seem higher/lower than it actually is		B1
	The rounding will not be accurate		B0
	The population is ever changing		B0

Q	Answer	Mark	Comments
7b	The population is increasing	B1	
	Additional Guidance		
	Accept any clear indication		

Q	Answer	Mark	Comments
7ci	Two correct criticisms, eg scale on x -axis isn't spaced evenly and y -axis starts on 100 (not zero)	B2	oe B1 one correct criticism
	Additional Guidance		
	The gaps between the lines (are different)		B1
	Some of the gaps between the lines are larger		B1
	Some larger gaps / Some large gaps (ambiguous)		B0
	(They are) unevenly spaced		B0
Both axes are wrong		B0	
The x -axis is wrong / The y -axis is wrong		B0	
Not enough values on the y -axis		B0	

Q	Answer	Mark	Comments
7cii	Yes ticked and a suitable reason given, eg we have the data for 2000 and 2010	B1	oe eg it's within the data range or interpolation
	Additional Guidance		
	No ticked		B0
	Yes may be implied, eg boxes left blank and we can estimate as we have the data for 2000 and 2010		B1
	Yes ticked and you can estimate it to be (175, 195)		B1
	It shows the growth clearly		B0
There are even increases		B0	

Q	Answer	Mark	Comments
7di	6	B1	

Q	Answer	Mark	Comments
7dii	20-29	B1	

Q	Answer	Mark	Comments
7diii	No and 6.4(%) and 7.9(%) or No and suitable reasoning	B2	oe B1 6.4(%) or 7.9(%)
	Additional Guidance		
	Any percentages quoted must be correct for B2		
	Yes ticked		B0
	No and there's 1.5% more females		B2
	No and there's a higher percentage of females (aged 60 and over) No and there's a higher number of females (aged 60 and over)		B2 B2
	No and 3 out of the 4 bars are longer for females, the 90+ bar is very similar No and 3 out of the 4 bars are longer for females		B2 B0

Q	Answer	Mark	Comments
8ai	4	B1	

Q	Answer	Mark	Comments
8aii	$20 < t \leq 30$	B1	

Q	Answer	Mark	Comments
8b	5	B1	

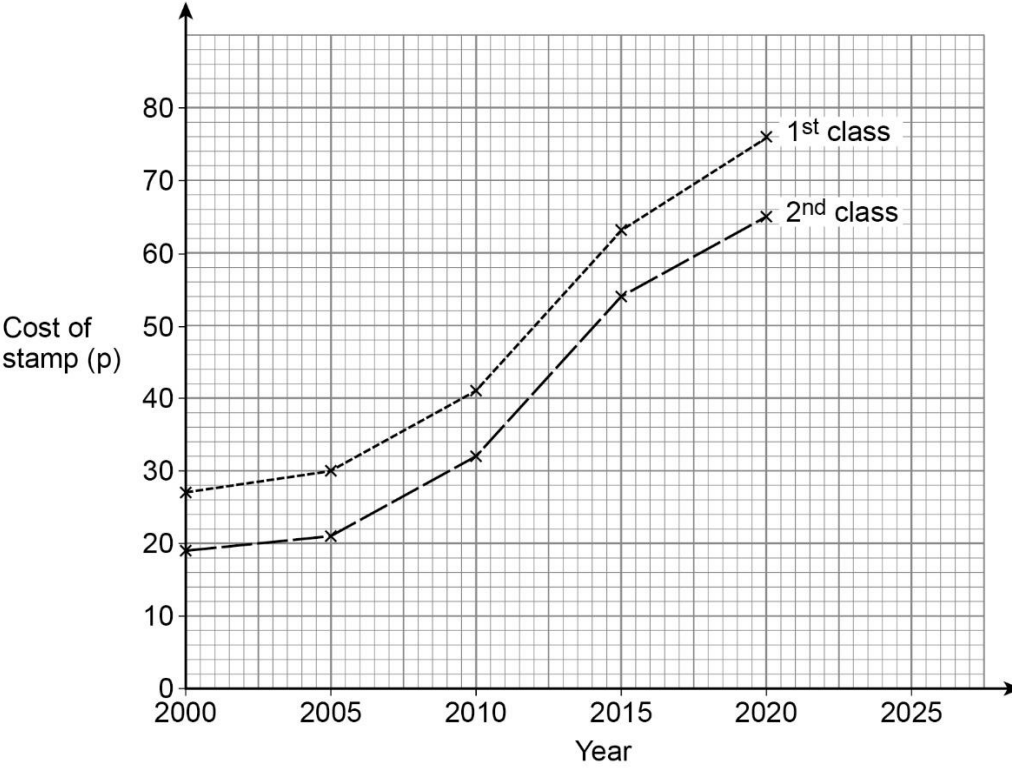
Q	Answer	Mark	Comments	
9a	Fully correct tree diagram	B2	oe B1 one correct branch, ie $\frac{1}{3}$ for B and $\frac{2}{3}$ for not B or $\frac{2}{5}$ for even and $\frac{3}{5}$ for odd	
	Additional Guidance			
	Decimals must be correct to 2dp or better Percentages must be correct to 1dp or better			
	Ignore any products			

Q	Answer	Mark	Comments
9bi	their $\frac{1}{3} \times$ their $\frac{2}{5}$	M1	oe
	$\frac{2}{15}$ or 0.13(...) or 13.3(...)%	A1ft	oe ft $0 < \text{their } \frac{1}{3} < 1$ from (a) and $0 < \text{their } \frac{2}{5} < 1$ from (a)
	Additional Guidance		
	Ignore any attempt to simplify or convert after correct fraction seen		

Q	Answer	Mark	Comments
9bii	their $\frac{2}{15} \times 300$ or 40	M1	oe
	$300 \times 2 - \text{their } 40 \times 4$	M1dep	oe
	440	A1ft	ft $0 < \text{their } \frac{2}{15} < 1$ from (b)(i)

Q	Answer	Mark	Comments
10a	False True False	B3	B1 for each correct row
	Additional Guidance		
	Accept any clear indication		

Q	Answer	Mark	Comments
10b	2010 – 2015 indicated and a suitable reason given, eg steepest part of the graph	B2	oe B1 2010 – 2015 indicated
	Additional Guidance		
	Any values quoted must be correct		
	Ignore any non-contradictory or irrelevant statements		
	Incorrect five-year period indicated		B0
	2010 – 2015 ticked and biggest gradient/slope		B2
	2010 – 2015 ticked and biggest change in price in the 5 year gaps		B2
	2010 – 2015 ticked and went up the most / has the biggest jump		B2
	2010 – 2015 ticked and it's the longest line		B2
	2010 – 2015 ticked and the incline is steeper than the rest		B2
	2010 – 2015 ticked and the incline is steeper		B1
2010 – 2015 ticked and gradient increases / steep gradient		B1	

Q	Answer	Mark	Comments																	
	Fully correct line graph	B3	B2 4 points plotted correctly and points joined with straight lines or all 5 points plotted correctly but not joined or incorrectly joined B1 3 or 4 points plotted correctly $\pm \frac{1}{2}$ small square																	
Additional Guidance																				
10c	 <p>Cost of stamp (p)</p> <p>Year</p> <p>1st class</p> <p>2nd class</p> <table border="1" data-bbox="414 808 1260 1579"> <caption>Data points from the line graph</caption> <thead> <tr> <th>Year</th> <th>1st class (p)</th> <th>2nd class (p)</th> </tr> </thead> <tbody> <tr> <td>2000</td> <td>27</td> <td>19</td> </tr> <tr> <td>2005</td> <td>30</td> <td>21</td> </tr> <tr> <td>2010</td> <td>41</td> <td>32</td> </tr> <tr> <td>2015</td> <td>63</td> <td>54</td> </tr> <tr> <td>2020</td> <td>76</td> <td>65</td> </tr> </tbody> </table>	Year	1st class (p)	2nd class (p)	2000	27	19	2005	30	21	2010	41	32	2015	63	54	2020	76	65	
Year	1st class (p)	2nd class (p)																		
2000	27	19																		
2005	30	21																		
2010	41	32																		
2015	63	54																		
2020	76	65																		
Mark intention for straight lines which can be solid, dashed or otherwise																				
Condone missing label																				
If a point is joined with a line then this takes precedence over any other points plotted for that year, otherwise choice																				

Q	Answer	Mark	Comments
10d	Alternative method 1		
	(65 – 19) ÷ 19 or 2.42(...) or 2.43	M1	oe
	[242, 243] (%)	A1	SC1 [342, 343]
	Alternative method 2		
	19 × 1.81 or 34.(...) or 35	M1	oe
	[53, 54] (p)	A1	SC1 [342, 343]
	Additional Guidance		
	2 nd class increased by 61% more (than 1 st class)		M1A1
Calculating a percentage increase greater than 181% of 19 with a correctly evaluated outcome less than 65, eg 19 × 3 = 57, this is a 200% increase		M1A1	

Q	Answer	Mark	Comments										
11(a)	Correct labels for rows 2 and 4	B1	$10 \leq m < 15$ and $20 \leq m < 25$										
	Correct frequencies for rows 3 and 4	B1	10 and 5										
	Additional Guidance												
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Mass, m (kg)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>$5 \leq m < 10$</td> <td>6</td> </tr> <tr> <td>$10 \leq m < 15$</td> <td>3</td> </tr> <tr> <td>$15 \leq m < 20$</td> <td>10</td> </tr> <tr> <td>$20 \leq m < 25$</td> <td>5</td> </tr> </tbody> </table>		Mass, m (kg)	Frequency	$5 \leq m < 10$	6	$10 \leq m < 15$	3	$15 \leq m < 20$	10	$20 \leq m < 25$	5	
	Mass, m (kg)	Frequency											
$5 \leq m < 10$	6												
$10 \leq m < 15$	3												
$15 \leq m < 20$	10												
$20 \leq m < 25$	5												

Q	Answer	Mark	Comments
11(b)	It's grouped data (so you cannot tell) or We don't have the actual data	B1	oe
	Additional Guidance		
	We do not know the exact masses		B1
	We do not know the masses		B0
	More than one of the dogs could have a mass of 5 kg		B1
	The six dogs in the $5 \leq m < 10$ category could all be 6 kg		B1
	They could all be above 5 / They could all be 5 / They could all be 5 or above		B1
	Because it's more than or equal to (5 kg)		B1
	It could be anywhere between 5 and 10		B1
	It could be anywhere between 5 and 9		B0
	It could be bigger than 5 / They could be just over 5 It could be 5, it could be more than 5 It will be bigger than 5		B1 B1 B0
	It's a range (implies grouped data)		B1
It's an average, not exact amounts Any reference to rounding It's an estimate No dogs have a mass of 5		B0 B0 B0 B0	

Q	Answer	Mark	Comments
11(c)	$9 \div 24$ or 0.375	M1	oe
	37.5	A1	SC1 digits 375
	Additional Guidance		
	Working may be seen in table		
	$9 \div 24$ or 0.375, answer 38		M1A1

Q	Answer	Mark	Comments
11(d)	Bars drawn to correct widths and Bars drawn to correct heights	B2	B1 Bars drawn to correct widths or Bars drawn to correct heights $\pm \frac{1}{2}$ small square
	Additional Guidance		
	Mark intention		
	Ignore shading		

Q	Answer	Mark	Comments
12 (a)	Mode = 0	B1	
	Mean = 8.6	B1	
	Additional Guidance		
	Do not accept 9 for Mean = 8.6		

Q	Answer	Mark	Comments
12 (b)(i)	No and a suitable reason eg it's the lowest number (in the list)	B1	oe
	Additional Guidance		
	Yes ticked		B0
	No and 80% of people did more exercise than the mode		B1
	No and 8 of the 10 exercised at least once		B1
	No and only 2 (of the 10) exercised zero times		B1
	No and it only represents 2 friends		B0
The mode has no value, it's 0		B0	

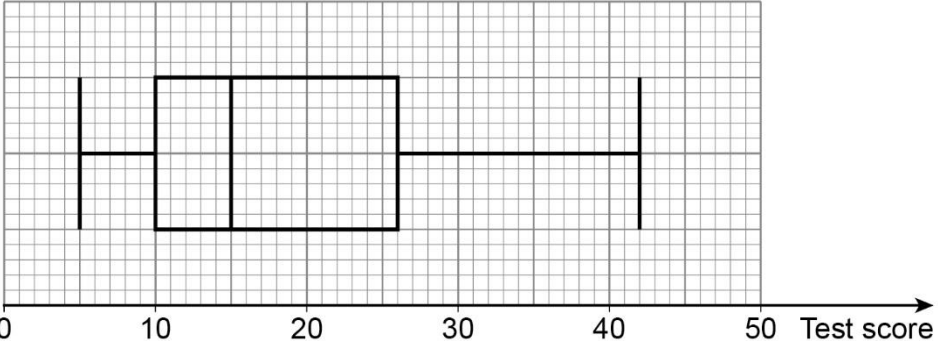
Q	Answer	Mark	Comments
12(b)(ii)	Yes and a suitable reason eg it is less affected by extreme values	B1	oe
	Additional Guidance		
	No ticked		B0
	Yes and there are two values much higher than the rest		B1
	Yes and it's in the middle of the data		B0
	Yes and doesn't include all the data		B0
	Yes and it's very similar to most of the numbers		B0
	Yes and it's not biased		B0
	Yes and it's not an actual value		B0

Q	Answer	Mark	Comments
12(b)(iii)	No and a suitable reason eg affected by extreme values	B1	oe
	Additional Guidance		
	Yes ticked		B0
	No and distorted/altered by the 29 and 30		B1
	No and only 20% of people did more exercise than the mean		B1
	No and only 2 (of the 10) did more exercise than the mean		B1
No and you can't exercise 8.6 times		B0	

Q	Answer	Mark	Comments
13(a)	Any suitable hypothesis, must be a prediction eg (students in school) A did better (in the French test than school B)	B1	oe
	Additional Guidance		
	Ignore any non-contradictory or irrelevant statements		
	Do not accept a question		
	Accept any tense		
	School A will do better (in the French test than school B)		B1
	School B did better (in the French test than school A)		B1
	School A will have a higher mean/median/average		B1
	I predict the schools will do similar		B1
Will school A do better (than school B)?		B0	

Q	Answer	Mark	Comments
13(b)	(All) Year 7 (students) in school A and school B	B1	oe
	Additional Guidance		
	All Year 7 students who sat the test in both schools		B1
	All Year 7 students who sat the test		B0
	All Year 7 students in the two schools		B1
	All Year 7 students in two (different) schools		B0
	Year 7 students that take French in both schools		B1
All Year 7 students (who study French)		B0	
All students in both schools		B0	

Q	Answer	Mark	Comments
13(c)	Method A		
	Correctly named as convenience (sampling)	B1	accept opportunity (sampling) or judgement (sampling)
	An advantage given about method A eg easy, quick, convenient	B1	oe
	Method B		
	Correctly named as random (sampling)	B1	comments about at random do not imply this mark
	An advantage given about method B eg every student has an equal chance of being picked or a wider range of students can be chosen or Sanjit cannot influence who is picked	B1	oe
	Additional Guidance		
	Ignore any non-contradictory or irrelevant statements		
	Condone random selection for Method B's name		
	Method B advantages: It's more representative Everyone has an equal chance of being picked More varied range of students More varied range of results/opinions It's not biased / It's fair (without further explanation)		B1 B1 B1 B0 B0

Q	Answer	Mark	Comments	
13(d)	(lower quartile =) 10	B1	may be seen in table	
	(median =) 15	B1	may be seen in table	
	(upper quartile =) 26	B1	may be seen in table	
	Fully correct box plot with: <ul style="list-style-type: none"> • a suitable numbered linear scale with a label, eg Test score • values of their median, lower quartile and upper quartile correctly plotted and box drawn • minimum and maximum values correctly plotted and whiskers drawn to meet box 	B3ft	ft their median and quartiles where $5 < \text{their LQ} < \text{their median}$ and $\text{their median} < \text{their UQ} < 42$ B2 2 bullet points satisfied B1 1 bullet point satisfied $\pm \frac{1}{2}$ small square	
	Additional Guidance			
				
	Condone missing label			
A box plot with no scale scores a maximum of B1B1B1B0				
For a scale to be suitable it must cover all of the data values (5 to 42)				

Q	Answer	Mark	Comments
13(e)(i)	20	B1	

Q	Answer	Mark	Comments
13(e)(ii)	On average (school) B did better (than school A)	B1ft	oe ft their median from 13(d) and/or their median from 13(e)(i)
	Additional Guidance		
	If calculations are used, the outcomes must be correct		
	In general / Overall school B did better		B1
	School A generally did worse		B1
School B did better		B0	
School B's median was higher so they did better		B1	
School B had a higher average/median		B0	

Q	Answer	Mark	Comments
13(f)(i)	14	B1	

Q	Answer	Mark	Comments
13(ii)	(The scores for school) A were less consistent (than school B) or (The scores for) both schools had similar consistency	B1ft	oe ft their interquartile range from 13(d) and their interquartile range from 13(f)(i)
	Additional Guidance		
	If calculations are used, the outcomes must be correct		
	School B was more consistent		B1
	B had a lower variation than A		B1
	School B scores varied less		B1
	School A's scores were more spread out than School B's		B1
	The spread of school A and school B scores was similar		B1
	The scores were similar		B0
	The interquartile range of school A was bigger than the interquartile range of school B		B0
Any reference to comparing the statistical range		B0	