

Mathematics B

General Certificate of Secondary Education

Unit **J567/03**: Paper 3 (Higher Tier)

Mark Scheme for November 2012

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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Annotations used in the detailed Mark Scheme.

Annotation	Meaning
✓	Correct
✗	Incorrect
BOD	Benefit of doubt
FT	Follow through
ISW	Ignore subsequent working (after correct answer obtained), provided method has been completed
M0	Method mark awarded 0
M1	Method mark awarded 1
M2	Method mark awarded 2
A1	Accuracy mark awarded 1
B1	Independent mark awarded 1
B2	Independent mark awarded 2
MR	Misread
SC	Special case
^	Omission sign

These should be used whenever appropriate during your marking.

The **M**, **A**, **B**, etc annotations must be used on your standardisation scripts for responses that are not awarded either 0 or full marks.

It is vital that you annotate these scripts to show how the marks have been awarded.

It is not mandatory to use annotations for any other marking, though you may wish to use them in some circumstances.

Subject-Specific Marking Instructions

1. **M** marks are for using a correct method and are not lost for purely numerical errors.
A marks are for an accurate answer and depend on preceding **M** (method) marks. Therefore **M0 A1** cannot be awarded.
B marks are independent of **M** (method) marks and are for a correct final answer, a partially correct answer, or a correct intermediate stage.
SC marks are for special cases that are worthy of some credit.
2. Unless the answer and marks columns of the mark scheme specify **M** and **A** marks etc, or the mark scheme is 'banded', then if the correct answer is clearly given and is not from wrong working **full marks** should be awarded.

Do not award the marks if the answer was obtained from an incorrect method, ie incorrect working is seen and the correct answer clearly follows from it.

3. Where follow through (**FT**) is indicated in the mark scheme, marks can be awarded where the candidate's work follows correctly from a previous answer whether or not it was correct.

Figures or expressions that are being followed through are sometimes encompassed by single quotation marks after the word *their* for clarity, eg FT $180 \times (\textit{their} '37' + 16)$, or FT $300 - \sqrt{(\textit{their} '5^2 + 7^2')}$. Answers to part questions which are being followed through are indicated by eg FT $3 \times \textit{their} (a)$.

For questions with FT available you must ensure that you refer back to the relevant previous answer. You may find it easier to mark these questions candidate by candidate rather than question by question.

4. Where dependent (**dep**) marks are indicated in the mark scheme, you must check that the candidate has met all the criteria specified for the mark to be awarded.
5. The following abbreviations are commonly found in GCSE Mathematics mark schemes.
 - **figs 237**, for example, means any answer with only these digits. You should ignore leading or trailing zeros and any decimal point eg 237000, 2.37, 2.370, 0.00237 would be acceptable but 23070 or 2374 would not.
 - **isw** means **ignore subsequent working** after correct answer obtained and applies as a default.
 - **nfww** means **not from wrong working**.
 - **oe** means **or equivalent**.
 - **rot** means **rounded or truncated**.
 - **seen** means that you should award the mark if that number/expression is seen anywhere in the answer space, including the answer line, even if it is not in the method leading to the final answer.
 - **soi** means **seen or implied**.

6. In questions with no final answer line, make no deductions for wrong work after an acceptable answer (ie **isw**) unless the mark scheme says otherwise, indicated for example by the instruction 'mark final answer'.
7. In questions with a final answer line following working space,
 - (i) if the correct answer is seen in the body of working and the answer given on the answer line is a clear transcription error allow full marks unless the mark scheme says 'mark final answer'. Place the annotation ✓ next to the correct answer.
 - (ii) if the correct answer is seen in the body of working but the answer line is blank, allow full marks. Place the annotation ✓ next to the correct answer.
 - (iii) if the correct answer is seen in the body of working but a completely different answer is seen on the answer line, then accuracy marks for the answer are lost. Method marks could still be awarded. Use the M0, M1, M2 annotations as appropriate and place the annotation ✗ next to the wrong answer.
8. As a general principle, if two or more methods are offered, mark only the method that leads to the answer on the answer line. If two (or more) answers are offered, mark the poorer (poorest).
9. When the data of a question is consistently misread in such a way as not to alter the nature or difficulty of the question, please follow the candidate's work and allow follow through for **A** and **B** marks. Deduct 1 mark from any **A** or **B** marks earned and record this by using the MR annotation. **M** marks are not deducted for misreads.
10. Unless the question asks for an answer to a specific degree of accuracy, always mark at the greatest number of significant figures even if this is rounded or truncated on the answer line. For example, an answer in the mark scheme is 15.75, which is seen in the working. The candidate then rounds or truncates this to 15.8, 15 or 16 on the answer line. Allow full marks for the 15.75.
11. Ranges of answers given in the mark scheme are always inclusive.
12. For methods not provided for in the mark scheme give as far as possible equivalent marks for equivalent work. If in doubt, consult your Team Leader.
13. Anything in the mark scheme which is in square brackets [...] is not required for the mark to be earned, but if present it must be correct.

Question		Answer	Marks	Part Marks and Guidance	
1	(a)	Correct reflection	2	B1 for reflection in $y = 1$ or for reflection of B in $x = 1$ or for reflection in $x = p$	Use overlay Green triangle scores 2 Either red triangle scores 1 Horizontal translation of green triangle scores 1
	(b)	Translation by $\begin{pmatrix} 6 \\ -4 \end{pmatrix}$	2	B1 for translation only And B1 for $\begin{pmatrix} 6 \\ -4 \end{pmatrix}$	B0 if more than one transformation mentioned Condone 6 right and 4 down Condone fraction line or missing brackets but not coordinates
2	(a)	Positive	1		Condone extras such as strong
	(b)	Ruled line of best fit 8 to 11	M1 A1		Ruled line of best fit passing between (7, 2) to (7, 6) and (20, 18) to (20, 23) Line at least as long as overlay Award 0 if no line drawn

Question			Answer	Marks	Part Marks and Guidance	
3	(a)	(i)	55 Corresponding [angles]	M1 A1	Accept any complete correct equivalent with full reasoning	Angle may be marked on diagram Condone F-angles
		(ii)	125 Alternate [angles with $p + 70$]	M1 A1	FT <i>their</i> (a)(i) + 70 or exterior angle of triangle After M0 , SC1 for correct reasons after attempt at <i>their</i> (a)(i) + 70 seen	Angle may be marked on diagram Condone Z-angles Accept correct equivalent reasons if at least 2 correct reasons seen If only one correct reason seen allow A1 if both 55° seen in triangle on diagram See exemplars Diagram may clarify explanation
	(b)		9	2	M1 for $360 \div 40$	Condone nonagon for M1
4	(a)		$2^{-1} \quad ^{-1} 2$	2	M1 for two correct	
	(b)		Correct smooth curve through all 7 correct points	2	B1 for at least 6 points plotted correctly FT <i>their</i> table	Use overlay Tolerance for plotting $\pm 1\text{mm}$ vertically from correct position for points Intention of correct smooth curve
	(c)		1.3 to 1.5 and $^{-1}1.3$ to $^{-1}1.5$	2	B1 for each correct value or FT <i>their</i> graph	Tolerance ± 0.1 for reading
5	(a)		40	2	M1 for 0.4 seen or $\frac{120}{300} [\times 100]$ oe or $10\% = 30$ or $1\% = 3$ used	

Question		Answer	Marks	Part Marks and Guidance	
	(b)	165.60	4	<p>M2 for attempt at 80% of 34.5[0] seen AND M1 for <i>their</i> '27.6' × 6 OR M1 for attempt at 20% of 34.5[0] seen AND M1 for <i>their</i> '6.9' × 6</p> <p>Alternative method</p> <p>M1 for attempt at 34.5[0] × 6 [= 207] soi AND M2 for attempt at 80% of <i>their</i> '207' seen OR M1 for attempt at 34.5[0] × 6 [= 207] soi AND M1 for attempt at 20% of <i>their</i> '207' [= 41.4] seen</p>	<p>165.6 scores 3 only Allow 4 for ans 16560p Methods may all be in pence Attempt at build-up methods for 80% or 20% must come from a reasonable attempt at 10%</p> <p>eg M2 for 34.50 – 6.90 seen or 0.8 × 34.50 oe [= 27.6]</p> <p>eg 0.2 × 34.50 oe [= 6.9] or attempt at 2 × 3.45</p> <p>eg 0.8 × <i>their</i> '207' or attempt at 8×<i>their</i> correct 10% or <i>their</i> '207' - 0.2 × <i>their</i> '207'</p> <p>eg 0.2 × <i>their</i> '207' oe or attempt at 2×<i>their</i> correct 10%</p>
	(c)	40	3	<p>M2 for 48 ÷ 1.2 oe</p> <p>Or M1 for 1.2 oe seen or 120 [%] soi</p>	<p>eg award M2 for $48 \times \frac{100}{120}$ seen</p> <p>120 may be implied by an equation</p>

Question	Answer	Marks	Guidance
6*	<p>Statement that Mike is incorrect, with fully correct justification, using three estimated calculations Calculations need to be clearly set out and annotated. Units need to be shown, and spelling, punctuation and grammar must be correct</p> <p>Correct conclusion, clearly showing evidence of a correct method, using rounding, which leads to a correct answer (£28 oe) Or Correct justification with full clearly presented method with one or two arithmetic slips</p> <p>Method showing one of the above estimated calculations eg seeing 4 gallons Or Attempt to find two of the following:</p> <ul style="list-style-type: none"> • No. of gallons– $195 \div 51.4 (=3.79)$ • No. of litres– <i>their</i> '3.79' $\times 4.55 (=17.2\dots)$ • Cost per gallon– $1.389 \times 4.55 (=6.31\dots)$ • No. of miles per litre– $51.4 \div 4.55 (=11.29\dots)$ • No. of litres– <math>195 \div \textit{their} '11.29'... ($=17.26\dots$)</math> • Cost– <i>their</i> '17.2' $\times 1.389$ • Cost– <i>their</i> '6.31' $\times \textit{their} '3.79'$ <p>Incorrect answer with no relevant content</p>	<p>5</p> <p>4-3</p> <p>2-1</p> <p>0</p>	<p>eg Number of gallons = $200 \div 50 = 4$ Number of litres = $4 \times 5 = 20$ Cost = $20 \times 1.40 = \text{£}28$ So Mike is not correct, car is cheaper Or Cost per gallon = $1.4 \times 5 = 7$ Number of gallons = $200 \div 50 = 4$ Cost = $7 \times 4 = 28$ Or Number of miles per litre = $50 \div 5 = 10$ Number of litres = $200 \div 10 = 20$ Cost = $20 \times 1.40 = 28$</p> <p>For lower mark Reaches a conclusion with evidence of correct process, but method incomplete or with errors. Or Method showing two of the above estimated calculations</p> <p>For lower mark At least two correctly rounded values seen (may be seen in table) Or Attempt to find one of the following:</p> <ul style="list-style-type: none"> • Number of gallons • Cost per gallon • Number of miles per litre

Question		Answer	Marks	Part Marks and Guidance	
7	(a)	Reasonably good estimate of probability as high number of repeats of experiment	1		See exemplars
	(b)	9, 3, 6, 6 or 8, 4, 6, 6	3	<p>M2 for two correct and total 24 or for three correct or 8.64, 3.6, 5.76, 6 seen OR M1 for attempt at relative frequency</p> <p>Alternative method M1 for <i>their</i> 'Y' = <i>their</i> 'B' AND M1 for <i>their</i> 'R + G' = 12 and <i>their</i> 'R' > <i>their</i> 'G'</p> <p>But SC0 for $24 \div 4 = 6$ leading to answer 6, 6, 6, 6</p>	eg $\frac{72}{200}$ soi
8	(a)	No, leading/biased question	1	Condone 'should be don't know option'	See exemplars
	(b)	Suitable question with at least 4 response boxes with non-overlapping categories covering all eventualities	2	<p>B1 for suitable question (condone suitable instruction) with 3 appropriate response boxes including 'other' or 'none' OR for 4 or more with an overlap or not covering all eventualities</p> <p>OR B1 for at least 4 appropriate response boxes with non-overlapping categories covering all eventualities</p>	<p>See exemplars</p> <p>In general, for 2 marks must include 'other' or 'none'</p> <p>Ignore extra questions</p>
	(c)	20	2	M1 for $\frac{150}{900} \times 120$ oe	

Question		Answer	Marks	Part Marks and Guidance	
9	(a)	-1.5 oe	3	<p>nfww M1 for collecting x terms on one side $6x - 2x + 5 = -1$ AND M1 for collecting constants on one side $6x - 2x = -1 - 5$ AND M1 for $x = \frac{b}{a}$ after $ax = b$ seen max 2 marks if answer incorrect</p> <p>OR SC2 for $6 \times -1.5 + 5 = 2 \times -1.5 - 1$ as final answer</p>	<p>eg $4x = -6$ implies M2 $6x - 2x = -4$ implies M1</p> <p>Condone unsimplified final answer eg $-\frac{6}{4}$ but not $-6 \div 4$ for 3 marks</p> <p>$a \neq 1, b \neq 0$</p>
	(b)	$2x(3 - 2x)$ final answer	2	<p>M1 for $2(3x - 2x^2)$ or $x(6 - 4x)$ SC1 for final answer $2x(3 + 2x)$</p>	<p>Condone $(2x + 0)(3 - 2x)$ Condone missing final bracket</p>
	(c)	$[\pm] \sqrt{\frac{S}{4\pi}}$ or $[\pm] \frac{1}{2} \sqrt{\frac{S}{\pi}}$ final answer	2	<p>M1 for one correct step seen</p> <p>After M0, SC1 for final answer correct but involving double decker fractions</p>	<p>Square root must clearly extend below division line Examples of one correct step $[r^2 =]S - 4\pi$ then $[r =] \sqrt{S - 4\pi}$ Or $[r^2] = \frac{S}{4\pi}$</p>

Question			Answer	Marks	Part Marks and Guidance													
10	(a)	(i)	All 6 points plotted correctly and joined with smooth curve or straight line segments	2	B1 for at least 5 points plotted at correct height within interval	Allow ± 1 mm for plotting points and drawing curve Condone curve starting at (20, 12) Bar chart only scores 0 Mark curve generously												
		(ii)	35 to 38	1	Or FT <i>their</i> curve													
		(iii)	29 to 34	2	M1 FT for 24 to 27 or 56 to 58 seen SC0 for 30 from $\frac{1}{4} \times 120$ oe	FT for LQ or UQ												
	(b)		Comment about average And Comment about spread of data <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Median</th> <th>IQR</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>Staff</td> <td>37</td> <td>30</td> <td>>100</td> </tr> <tr> <td>Students</td> <td>16</td> <td>36</td> <td>68</td> </tr> </tbody> </table>		Median	IQR	Range	Staff	37	30	>100	Students	16	36	68	1 1	eg On average travel time for staff was longer and Staff have a greater range of travel times	Travel times or context must be mentioned at least once for both marks to be awarded See exemplars For comment on spread assume IQR referred to unless range specified Accept eg IQR is the same for both if FT <i>their</i> staff IQR 35 to 37
	Median	IQR	Range															
Staff	37	30	>100															
Students	16	36	68															
11	(a)		[Area factor is] a quarter [not a half] oe	1	Accept [area factor is] scale factor squared	Stating scale factor is half is not sufficient												
	(b)		60	2	M1 for 8 or 2^3 soi	eg for $\frac{1}{8}$ seen												

Question		Answer	Marks	Part Marks and Guidance	
12	(a)	$p = 4, q = 1, r = 2$	2	B1 for any two correct or for correct 'tree' soi	Condone working leading to $2^4 \times 3^1 \times 5^2$ for 2 marks if not contradicted on answer line
	(b)	24 and 36	3	B2 for either 24 or 36 with another multiple of $12 \leq 72$ OR B1 for 12, 24, 36, 48 [...] listed OR M1 for $12 = 2 \times 2 \times 3$ AND M1 for $72 = 2 \times 2 \times 2 \times 3 \times 3$ OR SC1 for list of prime factors of 12 and 72 soi	eg 12 and 24 scores B2
13		$140 - 18\pi$ final answer	3	M1 for $\pi \times 6^2 \div 2$ oe soi AND M1 for $7 \times 20 - k\pi$	Ignore any units k need not be simplified

Question			Answer	Marks	Part Marks and Guidance	
14			(2, 2) (2, 3) (2, 4) (3, 2) (3, 3) (4, 2)	4	<p>All correct and no extras</p> <p>B3 for 3 correct no extras stated or all correct with no more than 4 extras stated or for all 6 points and no extras indicated on grid</p> <p>B2 for 3 correct with at most 1 extra either stated or marked on grid</p> <p>After B0 award M1 for line $x = 2$ or line $y = 1$ drawn AND M1 for line $x + y = 7$ drawn</p>	Overlay provided for lines
15	(a)	(i)	$3q - 2p$ oe isw	1		Simplest form not required
		(ii)	$p + 1.5q$ oe isw	1		Simplest form not required
	(b)		$\overline{MN} = 1.5q$ and MN is parallel to AC soi Trapezium	2 1	M1 for attempt to find \overline{MN}	May be seen on diagram
16	(a)		81 final answer	2	M1 for 9^6 or 9^2 or $9^{\frac{6}{3}}$ seen	$\sqrt[3]{\frac{9^{10}}{9^4}}$ scores 0
	(b)		$\frac{31}{90}$ isw	2	M1 for $10r = 3.44[\dots]$ or $100r = 34.4[\dots]$ or for $\frac{1}{3} + \frac{1}{90}$ or $\frac{3}{10} + \frac{4}{90}$	Implied by $90r = 31$ or $\frac{3.1}{9}$ seen

Question		Answer	Marks	Part Marks and Guidance	
17	(a)	6	4	nfw M2 for correct elimination of fractions $4(4x + 3) - 3(3x - 2) = 5 \times 4 \times 3$ OR M1 for multiplication by 3 and 4 soi AND M1 FT for expansion of brackets and collecting terms to $ax + b = 0$ or $ax = b$ AND M1 for $x = \frac{b}{a}$ after $ax = b$ seen max 3 marks if answer incorrect	M2 may be implied by $16x + 12 - 9x \pm 6 = 60$ $7x - 42 = 0$ or $7x = 42$ $a \neq 1, b \neq 0, a \neq b$
	(b)	$\frac{7}{3a}$ final answer	2	M1 for $\frac{9}{6a} + \frac{5}{6a}$ or better or any equivalent of $\frac{7}{3a}$ seen	
	(c)	$\frac{x+4}{x+5}$ final answer	4	M1 for $(x+4)(x-4)$ seen AND M2 for $(x-4)(x+5)$ seen OR M1 for $(x \pm 4)(x \pm 5)$ seen	Condone missing outer brackets

Question		Answer	Marks	Part Marks and Guidance	
18	(a)	52	1		
	(b)	<p>$\angle OAT = \angle OBT = 90^\circ$ angle between tangent and radius OA = OB radius of circle OT is common</p> <p>$\Delta ATO, BTO$ congruent, RHS [Hence AT = BT]</p>	<p>M1 M1 M1 A1</p>	<p>Statement about tangent perpendicular to radius Statement about equal radii or $OT = OT$ oe</p> <p>Dependent on M3</p> <p>After M0, SC1 for $A = B = 90^\circ$ and $OA = OB$ stated</p>	<p>90° may be indicated on diagram</p>

Question	Answer	Marks	Part Marks and Guidance
19	$x = 8, y = 21$ $x = -2, y = 1$	5	<p>nfww M2 for $x^2 - 6x - 16$</p> <p>OR</p> <p>M1 for attempting to equate eg $x^2 - 4x - 11 = 2x + 5$ oe AND M1 FT factorising <i>their</i> quadratic $(x - 8)(x + 2)$</p> <p>AND</p> <p>A1 for $x = 8, x = -2$ A1 for $y = 21, y = 1$</p> <p>After A0, allow SC1 for one pair of x and y values correct or for both y values correctly FT <i>their</i> x values substituted into $y = 2x + 5$</p> <p>Or $y^2 - 22y + 21$</p> <p>M1 for reaching quadratic equation in one variable</p> <p>$(y - 21)(y - 1)$</p> <p>Or correct FT substitution into formula leading to $\frac{6 \pm \sqrt{36 + 64}}{2}$</p> <p>Allow A marks if solutions clear in working, just transferred to wrong places on answer lines</p>

APPENDIX 1

Exemplar responses for Q3(a)(ii)

Acceptable equivalent reasons are:

[Angles in a] triangle = 180

[Angles on a straight] line = 180

Vertically opposite [angles]

[Vertically] opposite angles equal

[Angles at a] point = 360

[Co]-interior/allied [angles] = 180 or C/U [angles] = 180

Response	Mark awarded
125, alternate angles then $180 - 55 = 125$	M1A1
125, angles in a triangle sum 180, opposite angles are equal, angles on a straight line sum 180	M1A1
125, angles in a triangle add to 180 and angles on a straight line add to 180	M1A1
125, the angle reflects off the opposite to make 55 next to it, then it needs to add up to 180 on a straight line [with both 55 marked in triangle]	M1A1 ignore first reason second reason and diagram scores A1
125, angles in a triangle. Angles on a straight line	M1A0 [both 180s need to be seen]
125, angles on a straight line add up to 180	M1A0 unless both 55s marked in triangle
125, triangle = 180 so 2 of the 360 angles are 55 the other 2 (q) are equal so must be 125 to make 360	M1A0 unless both 55s marked in triangle
125, $70 + 55 =$ angle q because there both on the same line and to get q you must add them	M1A0
70, it is also an opposite angle	MOA0
135, $55 + 70 = 135$, 135 is the adjacent angle on a z angle	MOA0 SC1 as reason acceptable and addition seen
140, it is an alternate angle and an angle around a point	MOA0 SC0 as addition not seen

Exemplar responses for Q7(a)

Response	Mark awarded
Because she has done it loads of times, so she could see how accurate she could be.	1
She does the test fairly, and does it 200 times so some evidence of the proportions must be starting to show.	1
Because 200 is a decent sample size so by picking each colour from the bag that many times would be representative of all counters	1
Because she has a large sample	1
She has repeated the experiment a large number of times	1
She has the frequency and enough data to do this	1
Because she did it so many times she can get an accurate reading and the number of each colour is close to 200	1 borderline, ignore final part of comment
Because she's done it 200 times, she should have quite a good idea about the amount there is of each colour.	0 borderline
She did it a fair number of times therefore it would be reasonable for Alisha to use her results to estimate the number	0
The higher the frequency of each colour that appears, the more counters there will be of that colour	0
If the colour gets picked more frequently the chances are there are more in the bag.	0
She did the test 200 times so it is reliable	0
She has done a fair test with accurate results	0
Because she has tested it 200 times meaning there is a high possibility that it is accurate	0
Because she has recorded enough data and not taken a counter out of the bag enough times	0 contradiction
Doing it 200 times makes an average amount	0
The result is reflecting the % of all balls in the bag. Also she did 200 times which makes the result more accurate	0
She has done the test 200 times and got a good range of results for each colour	0

Exemplar responses for Q8(a)

Response	Mark awarded
No, it's a closed question and makes the person feel like they have to agree because of the way it's written.	1
No, the question is biased.	1
No, it says 'do you agree' which is Lewis's opinion	1
No, it is biased, it demands a yes or no answer whereas someone might not know, there are not enough choices.	1
No, he's saying his opinion and then asking you if you agree	1
No, it has no reason why you should do it, biased question	1
No, someone might be unsure so there should be a box for 'I don't mind'	1
No, there is no middle answer	0 'middle' not specific enough

Exemplar responses for Q10(b)

Response	Mark awarded
The IQR is the same for the students and the staffs times both consistent The median time for the students (16 mins) is 28 minutes lower than the staffs (34 mins)	1 [FT their IQR of 35 to 37] 1
The students interquartile range is longer The teachers median is larger	1 0 [no reference to context]
The teachers had a higher median and interquartile range so they travel further or slower that the students The students are more consistent	1 [IQR separate comment] 0 [incorrect]
The median mark for the students is lower than the staff They are equally consistent	1 [ignore wrong context] 0 [no use of context]
The students on average take less time getting to school The students are also more consistent	1 0
Staff generally take more time to travel to school than students The distribution of students travel times are more close to the left compare to the staff	1 0
Overall the students take less time to get to school The students have a wider range of times taken to get to school	1 0 [wider spread scores]
Most students get to school in 20 minutes or less most staff take more than 20 but less than 40 No student takes longer than 70 minutes whereas some staff take 100 to 120 minutes	0 1 [implies spread]
The students have a lower interquartile range of 34 The longest child takes 70 minutes but the longest member of staff takes 120 minutes	0 [incorrect] 1 [bod understanding]
The range of the children is much smaller	1
The students only took 70 minutes to get to school, the teachers 120 The median is 16 for the students and 36 for the teachers, it doubled	0 1
The time taken by staff is far longer The interquartile range of students is longer, the students times are distributed more evenly	0 [needs average] 0 [contradiction]
The staff have a larger interquartile range therefore the students times are more constant The students have a lower median time	0 1
Students had a faster mean. Students had a short range.	0 [mean not median] 0 [no comparison]
Both arrive in about 20 minutes No one takes more than about 45 minutes	0 0
The median was a lot lower meaning generally the time was faster The highest value was a lot lower	0 [must specify student/staff] 0

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