



## Unit 2 Revision Sheet H Representation of Data and Statistical Measures Higher

***Note: Higher tier students must also revise using the foundation tier revision worksheets as this content can also be assessed on higher tier papers.***

### **Questions**

**Q1.**

Jethro has sat 5 tests.

Each test was marked out of 100 and Jethro's mean mark for the 5 tests is 74

Jethro has to sit one more test that is also to be marked out of 100

Jethro wants his mean mark for all 6 tests to be at least 77

Work out the least mark that Jethro needs to get for the last test.

**(Total for question = 3 marks)**

**Q2.**

15 students took an English test.

The same 15 students took a Maths test.

Both tests were marked out of 30

For the English test results

the median was 21

the interquartile range was 14

The Maths test results are shown below.

18 18 19 20 24 25 25 26 28 28 29 29 29 30 30

Use the information above to compare the English test results with the Maths test results.

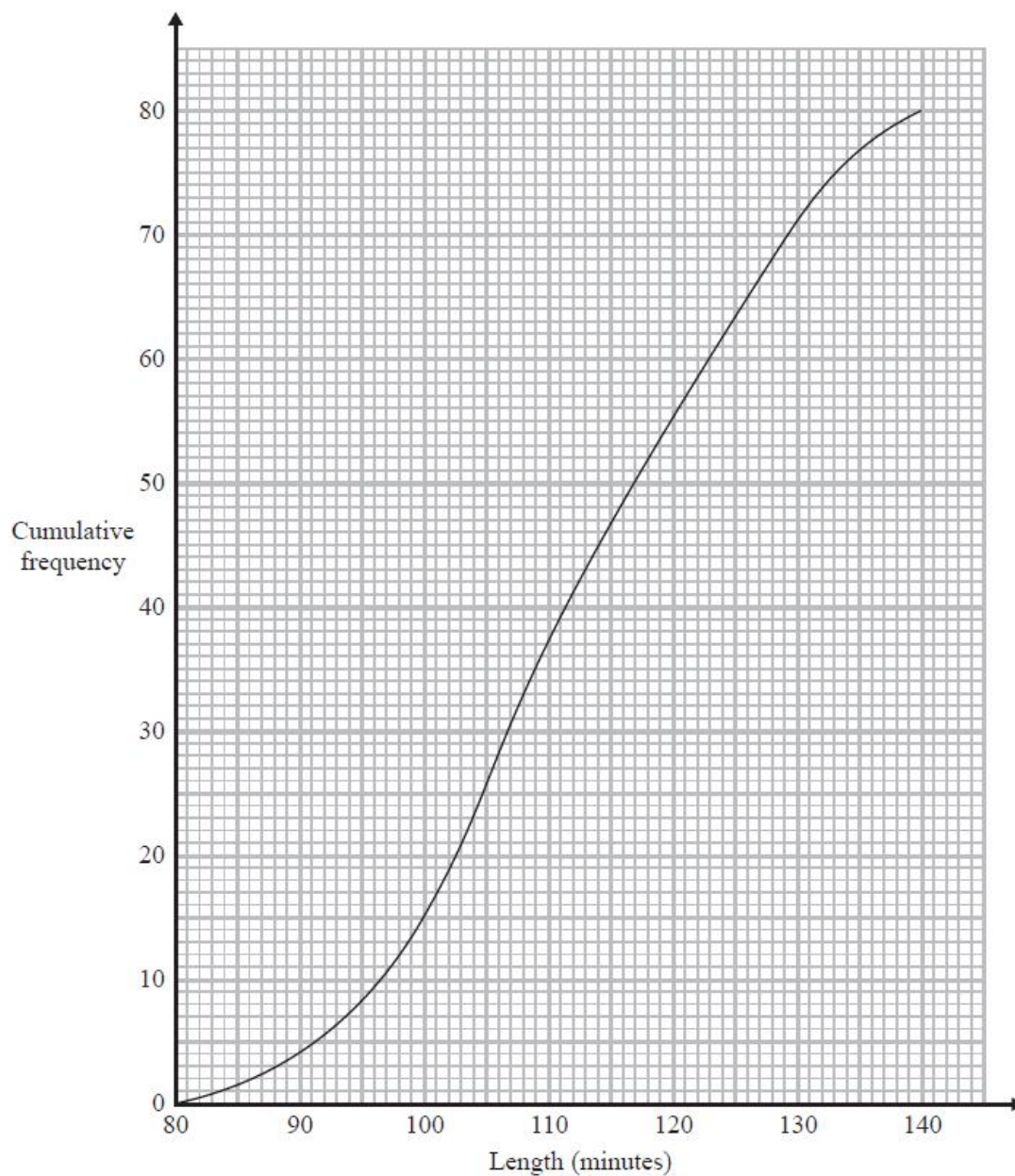
Write down **two** comparisons.

**(Total for question = 4 marks)**



**Q3.**

The cumulative frequency graph shows information about the length, in minutes, of each of 80 films.



(a) Use the graph to find an estimate for the interquartile range.

(2)

Clare says,

"More than 35% of these films are over 120 minutes long."

(b) Is Clare correct?

Give a reason for your answer.

(3)

**(Total for question = 5 marks)**



**Q4.**

The table gives information about the times taken, in minutes, for 80 taxi journeys.

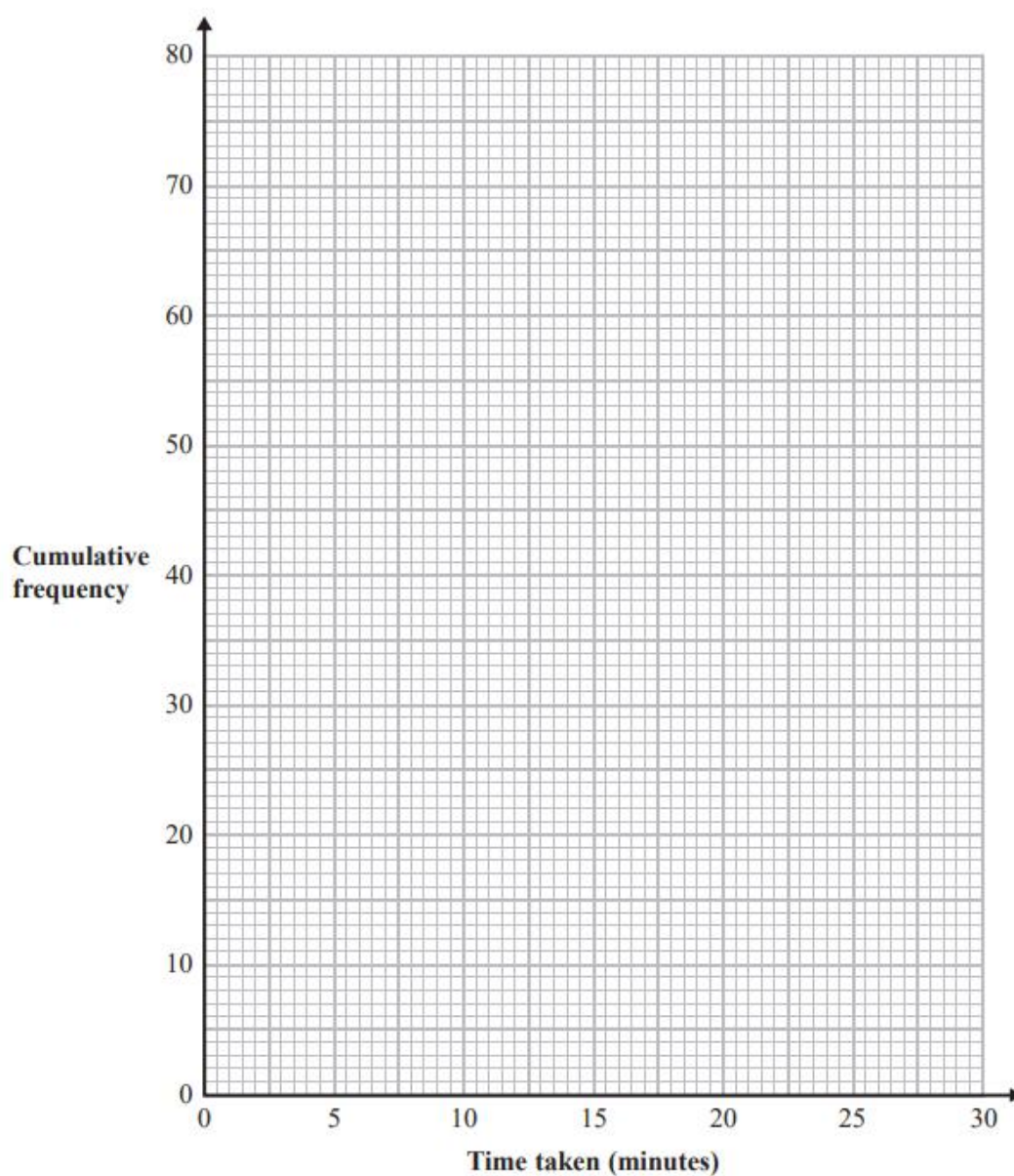
Time taken ( $t$ minutes)	Frequency
$0 < t \leq 5$	7
$5 < t \leq 10$	10
$10 < t \leq 15$	12
$15 < t \leq 20$	19
$20 < t \leq 25$	18
$25 < t \leq 30$	14

(a) Complete the cumulative frequency table.

Time taken ( $t$ minutes)	Cumulative frequency
$0 < t \leq 5$	
$0 < t \leq 10$	
$0 < t \leq 15$	
$0 < t \leq 20$	
$0 < t \leq 25$	
$0 < t \leq 30$	

(1)

(b) On the grid, draw a cumulative frequency graph for your table.



- (c) Use your graph to find an estimate for the median. (2)
- (d) Use your graph to find an estimate for the interquartile range. (1)
- (2)

(Total for question = 6 marks)



**Q5.**

The table shows information about the lengths of time, in minutes, 120 customers spent in a supermarket.

Length of time ( $L$ minutes)	Frequency
$20 < L \leq 30$	6
$30 < L \leq 40$	26
$40 < L \leq 50$	31
$50 < L \leq 60$	40
$60 < L \leq 70$	17

(a) Write down the modal class.

(1)

(b) Work out an estimate for the mean length of time spent by the 120 customers in the supermarket.

(4)

**(Total for question = 5 marks)**

**Q6.**

15 people were asked how long, in minutes, they had been waiting for a bus.

Here are the results.

2    3    3    4    5    6    6    8    9    10    11    13    14    15    18

Find the interquartile range of these times.

**(Total for question = 2 marks)**

**Q7.**

Here is a list of six numbers written in order of size.

4    7     $x$     10     $y$      $y$

The numbers have

a median of 9

a mean of 11

Find the value of  $x$  and the value of  $y$ .

**(Total for question = 4 marks)**



**Q8.**

Twenty students took a Science test and a Maths test.

Both tests were marked out of 50

The table gives information about their results.

	Median	Interquartile range
Science	27	18
Maths	24.5	11

Use this information to compare the Science test results with the Maths test results.  
Write down **two** comparisons.

**(Total for question = 2 marks)**

**Q9.**

Ian plays 7 games of cricket.

His mean score per game for these 7 games is 42 runs.

Ian is going to play one more game of cricket.

He wants his mean score per game for the 8 games to be exactly 50 runs.

How many runs must he score in his 8th game?

**(Total for question = 3 marks)**





## Mark Scheme

Q1.

Q	Working	Answer	Mark	Notes	
	$5 \times 74 (= 370)$ or $6 \times 77 (= 462)$ or $5 \times 0.74 (= 3.7)$ or $6 \times 0.77 (= 4.62)$		3	M1 one correct product	M2 for $74 + (3 \times 6)$ oe or $77 + (3 \times 5)$ oe (where $3 = 77 - 74$ )
	$6 \times 77 - 5 \times 74$ or “462” – “370” or $(6 \times 0.77 - 5 \times 0.74) \times 100$ or (“4.62” – “3.7”) $\times 100$			M1 from correct working	
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	92		A1 allow 92/100 or 92% or 92 out of 100  (trial and error scores no marks unless correct – and then it gains full marks)	
				Total 3 marks	

Q2.

Q	Working	Answer	Mark	Notes	
	median = 26 or LQ = 20 or UQ = 29			M1	
	iqr = 9 and median = 26			A1	
				B1	ft comparison of IQR eg. English results were more spread out
		median = 26; iqr = 9 and two comparisons	4	B1	ft comparison of median eg. Maths results were higher <b>NB. In order to award both marks, at least one of the comparisons must be in context</b>
				Total 4 marks	



Q3.

Question	Working	Answer	Mark	Notes
a	Readings from graph at cf 20 and cf 60 eg. readings of 103 and 123	20.5	2	M1  A1 for answer in range 19 – 21
b	Reading from graph from time = 120 (=55) or 80 – 55 (=25)  $0.35 \times 80 (=28)$ or e.g. $\frac{80 - "55"}{80} \times 100$ oe (=31(.25)) or $\frac{"55"}{80} \times 100$ oe (= 68(.75))	No with correct figures	3	M1 accept reading in range 55 – 56  M1 accept a value in the range 30 – 31.25 or a value in the range 68 – 70 for this mark unless clearly from incorrect working  A1 eg. No with 28 and 25 or No with 31.25% (accept value in range 30% – 31.25%) or No with 68.75% and 65% (accept value in range 68% – 70%)





	<b>Alternative scheme</b> $0.65 \times 80 (=52)$  Reading from graph from cf = 52 (=118) <b>or</b> Reading from graph from time = 120 (=55)	No with correct figures	3	M1  M1 accept reading in range 55 – 56  A1 eg. No with 118 (minutes) <b>or</b> No with 52 and 55
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Q4.

Question	Working	Answer	Mark	Notes
(a)		7, 17, 29, 48, 66, 80	1	B1 cao
(b)				M1 ft from (a) if only one addition error  for at least 4 points plotted correctly at end of interval <b>or</b>  for all 6 points plotted consistently within each interval in the frequency table at the correct height
		Correct cf graph	2	A1 accept curve or line segments accept curve that is not joined to (0,0)
(c)		17 – 19	1	B1 ft from a cumulative frequency graph dep on M1 in (b)
(d)	For correct use 20 and 60 (20.25 and 60.75) indicated (horizontal line or mark) on the cumulative frequency axis and their readings taken from time taken axis  e.g. readings of 11–13 and 22–24 indicated on horizontal axis or 23 – 12			M1 for a complete method to ft from a cumulative frequency graph dep on M1 in (b)
		9 – 13	2	A1 accept 9 – 13 ft from a cumulative frequency graph dep on M1 in (b)
				<b>Total 6 marks</b>



Q5.

	Working	Answer	Mark	Notes
a		$50 < L \leq 60$	1	B1 oe eg 50 - 60
b	$25 \times 6 + 35 \times 26 + 45 \times 31 + 55 \times 40 + 65 \times 17$ $(150 + 910 + 1395 + 2200 + 1105)$ $(= 5760)$			M2 For correct products using midpoints (allow one error) with intention to add. M1 for products using frequency and a consistent value within the range (allow one error) with intention to add or correct products using midpoints (allow one error) without addition
	$"5760" \div "120"$			M1 dep on M1
		48	4	A1
Total 5 marks				

Q6.

Q	Working	Answer	Mark	Notes
	13 – 4		2	M1 For selecting 4 and 13
		9		A1
				Total 2 marks

Q7.

Q	Working	Answer	Mark	Notes
	$\frac{x+10}{2} = 9$ or $x = 8$		4	M1 (indep)
	$\frac{4+7+x+10+y+y}{6} = 11$ oe or $'66' - 4 - 7 - 10 (= 45)$			M1 where $x$ may be a number $7 < x < 10$
	$(y =) (6 \times 11 - 4 - 7 - 10 - '8') \div 2$			M1 fit their median provided $7 < x < 10$ for a fully correct method
		$x = 8$ and $y = 18.5$ oe		A1
Total 4 marks				



**Q8.**

Question	Working	Answer	Mark	Notes
	<p>Basic comparisons from information: eg</p> <p>The median is greater for Science/less for Maths</p> <p>The IQR (or range) is higher for Science/less for Maths</p> <p>The median is 2.5 marks higher for Science</p> <p>The IQR (or range) is 7 marks more for Science</p> <p>Comparisons in context: eg</p> <p>On the whole students have higher marks in Science</p> <p>The spread of results is greater for Science</p> <p>Results are more consistent for Maths</p>	Two comparisons one for IQR and one for median	2	<p>B2 For 2 comparisons in context or 1 basic comparison and 1 comparison in context</p> <p>(B1 for 1 or 2 basic statements or for 1 statement in context)</p> <p>NB; any numbers used must be correct for the award of the mark</p>

**Q9.**

Q	Working	Answer	Mark	Notes
	$42 \times 7 (=294)$ or $8 \times 50 (=400)$			M1
	$8 \times 50 - 42 \times 7$			M1
		106	3	A1
				<b>Total 3 marks</b>