

Measures of Location and Spread-Edexcel Past Exam Questions **MARK SCHEME**

Question 1 : Jan 07 Q4

Question number	Scheme	Marks
1. (a)	$19.5 + \frac{(60-29)}{43} \times 10, = 26.7093\dots$ awrt 26.7 (N.B. Use of 60.5 gives 26.825... so allow awrt 26.8)	M1, A1 (2)
(b)	$\mu = \frac{3550}{120} = 29.5833\dots$ or $29\frac{7}{12}$ awrt 29.6 $\sigma^2 = \frac{138020}{120} - \mu^2$ or $\sigma = \sqrt{\frac{138020}{120} - \mu^2}$ $\sigma = 16.5829\dots$ or ($s = 16.652\dots$) awrt 16.6 (or $s = 16.7$)	B1 M1 A1 (3)
(c)	Use <u>Median</u> Since the data is skewed <u>or</u> less affected by outliers/extreme values	B1 dB1 (2)
(d)	If the data are <u>symmetrical</u> or <u>skewness is zero</u> or <u>normal/uniform distribution</u> ("mean =median" or "no outliers" or "evenly distributed" all score B0)	B1 (1) 14 marks
(a)	M1 for $(19.5 \text{ or } 20) + \frac{(60-29)}{43} \times 10$ or better. Allow 60.5 giving awrt 26.8 for Allow their $0.5n$ [or $0.5(n+1)$] instead of 60 [or 60.5] for M1.	M1A1
(b)	M1 for a correct expression for σ, σ^2, s or s^2 . NB $\sigma^2 = 274.99$ and $s^2 = 277.30$ Condone poor notation if answer is awrt 16.6 (or 16.7 for s)	
(c)	2 nd B1 is dependent upon choosing median.	



Question 2 : June 05 Q2

2. (a)	Distance is a continuous.	continuous	B1	(1)
(b)	F.D = freq/class width \Rightarrow 0.8, 3.8, 5.3, 3.7, 0.75, 0.1	or the same multiple of	M1 A1	(2)
(c)	$Q_2 = 50.5 + \frac{(67-23)}{53} \times 10 = 58.8$	awrt 58.8/58.9	M1 A1	
	$Q_1 = 52.48; Q_3 = 67.12$	awrt 52.5/52.6 67.1/67.3	A1 A1	(4)
	Special case : no working	B1 B1 B1 (= A's on the open)		
(d)	$\bar{x} = \frac{8379.5}{134} = 62.5335\dots$	awrt 62.5	B1	
	$s = \sqrt{\frac{557489.75}{134} - \left(\frac{8379.5}{134}\right)^2}$		M1 A1√	
	$s = 15.8089\dots$ ($S_{n-1} = 15.86825\dots$)	awrt 15.8 (15.9)	A1	(4)
	Special case : answer only	B1 B1 (= A's on the open)		

Question 3 : Jan 11 Q2

Question Number	Scheme	Marks
(a)	$2.8 + 5.6 + 2.3 + 9.4 + 0.5 + 1.8 + 84.6 = 107$ mean = $107 / 28 (= 3.821\dots)$	M1 A1 (2)
(b)	It will have no effect since one is 4.5 under what it should be and the other is 4.5 above what it should be.	B1 dB1 (2) [4]
Notes		
(a)	M1 for a clear attempt to add the two sums. Accept a full expression or $2.8 + 5.6 + \dots + 84.6 = x$ where $100 < x < 110$ i.e. seeing at least two correct terms of Keith's and the 84.6 with a slip. A1 for awrt 3.8 (Condone 1 dp/2sf here since data is given to 1 dp or 2 sf) Accept $\frac{107}{28}$ or $3\frac{23}{28}$ or any exact equivalent Correct answer implies M1A1	
(b)	1 st B1 for clearly stating that it will have no effect. ("roughly the same" is B0 B0) 2 nd dB1 for a supporting reason that mentions the fact that the increase and decrease are the same and gives some numerical value(s) to support this. e.g. Sum of Keith's observations is still 22.4 (or mean is still 3.2) or Sum is still 107 or $9.4 - 4.9 = 5 - 0.5$ (o.e.) This second B1 is dependent on their saying there is no effect so B0B1 is not possible.	



Question 4 : June 06 Q2

(b)	Estimate of mean time spent on their conversations is $\bar{x} = \frac{1060}{55} = 19\frac{3}{11} \text{ or } 19.2\dot{7} \text{ or } 19.3$	1060/total, awrt 19.3 or 19mins 16s M1A1 (2)
(c)	$\frac{1060 + \sum .fy}{80} = 21$ $\sum .fy = 620$ $\therefore \bar{y} = \frac{620}{25} = 24.8$	21x80=1680 B1 Subtracting 'their 1060' M1 Dividing their 620 by 25 M1A1 (4)
(d)	Increase in mean value. Length of conversations increased considerably during 25 weeks relative to 55 weeks	context - ft only from comment above B1 B1 (2)