

Averages from Frequency Tables

November 2024 Paper 3

Question	Answer	Mark	Mark scheme	Additional guidance
15 (a)	9.9	M1	for starting process by multiplying ages by frequencies, with at least 3 correct, eg $8 \times 6, 9 \times 7, 10 \times 15, 11 \times 11, 12 \times 2$ or at least 3 of 48, 63, 150, 121, 24	May be seen next to table. 406 implies this mark $\sum fx$ must come from 5 products If an answer is given in the range in working and then rounded incorrectly award full marks.
		M1	(dep on M1) for $\sum fx \div \sum f$, eg $406 \div 41$ or $406 \div (6 + 7 + 15 + 11 + 2)$ or $(8 \times 6 + 9 \times 7 + 10 \times 15 + 11 \times 11 + 12 \times 2) \div 41$	
		A1	Answer in the range 9.9 to 9.91	
(b)	No, with explanation	C1	No, with explanation, Acceptable examples No as the mode/modal age is 10 No it should be 10 (not 15) No because 15 is the number of children that are age 10 (not age 15) No because there are no 15 year olds No because the frequency tells us the number of children for that age No he needs to give the age of the highest frequency Not acceptable examples No he is not, the modal is the one that occurs the most Yes / Rohan is correct No, the mode is 11	

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15 (a)	774	M1	for at least three of $0 \times 3 (= 0)$ or $1 \times 57 (= 57)$ or $2 \times 84 (= 168)$ or $3 \times 75 (= 225)$ or $4 \times 81 (= 324)$ or for $0 \times 3 + 1 \times 57 + 2 \times 84 + 3 \times 75 + 4 \times 81$	Note if 2 non zero products are seen award M1 Use of the figure 777 is enough for M1
(b)	3	A1	cao	
		M1	for method to begin to work with the median, eg $300 \div 2 (= 150)$	Accept 301 in place of 300
		A1	cao	NB mean = 2.58

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17	176	M1 A1	for a method to find 5 products within intervals (including end points) for $\Sigma "fx" \div (8 + 14 + 24 + 30 + 4)$ or $(155 \times 8 + 165 \times 14 + 175 \times 24 + 185 \times 30 + 195 \times 4) \div (8 + 14 + 24 + 30 + 4)$ or $(\text{"1240"} + \text{"2310"} + \text{"4200"} + \text{"5550"} + \text{"780"}) \div \text{"80"}$ or $\text{"14080"} \div \text{"80"}$ cao	<table border="1" data-bbox="1715 201 2047 408"> <thead> <tr> <th data-bbox="1715 201 1879 233">Min fx</th> <th data-bbox="1879 201 2047 233">Max fx</th> </tr> </thead> <tbody> <tr> <td data-bbox="1715 233 1879 264">1200</td> <td data-bbox="1879 233 2047 264">1280</td> </tr> <tr> <td data-bbox="1715 264 1879 296">2240</td> <td data-bbox="1879 264 2047 296">2380</td> </tr> <tr> <td data-bbox="1715 296 1879 328">4080</td> <td data-bbox="1879 296 2047 328">4320</td> </tr> <tr> <td data-bbox="1715 328 1879 360">5400</td> <td data-bbox="1879 328 2047 360">5700</td> </tr> <tr> <td data-bbox="1715 360 1879 392">760</td> <td data-bbox="1879 360 2047 392">800</td> </tr> </tbody> </table> <p data-bbox="1648 408 2101 475">$\Sigma "fx"$ must come from 5 products fx within intervals (including end points)</p>	Min fx	Max fx	1200	1280	2240	2380	4080	4320	5400	5700	760	800
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22 (a)	24.6	M1 M1 A1	for finding 5 products within intervals (including end points) with not more than one error, may be seen near table. eg $2 \times 12.5 (= 25)$, $8 \times 17.5 (= 140)$, $13 \times 22.5 (= 292.5)$, $21 \times 27.5 (= 577.5)$, $6 \times 32.5 (= 195)$ or for 1230 for $\Sigma fx \div \Sigma f$ eg (“25” + “140” + “292.5” + “577.5” + “195”) \div “50” or “1230” \div “50” for 24.6 oe	<table border="1" data-bbox="1576 197 1912 408"> <thead> <tr> <th>Min fx</th> <th>Max fx</th> </tr> </thead> <tbody> <tr> <td>20</td> <td>30</td> </tr> <tr> <td>120</td> <td>160</td> </tr> <tr> <td>260</td> <td>325</td> </tr> <tr> <td>525</td> <td>630</td> </tr> <tr> <td>180</td> <td>210</td> </tr> </tbody> </table> <p>Σfx must come from 5 products, fx within intervals (including end points)</p>	Min fx	Max fx	20	30	120	160	260	325	525	630	180	210
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22 (b)	No, with reason	C1	for No and reason Acceptable No, the median is in the interval $25 < T \leq 30$ No, the median is in the group containing the 25(.5)th temperature No, she did not take into account frequency No, the frequencies are not the same for each group. Not acceptable No, the median is 27.5 No, the median is higher than 22.5 $25 < T \leq 30$ Yes, ...	Any incorrect statement as part of a correct response can be ignored unless it contradicts the statement,												

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28	(a)	B1	cao	do not award this mark if the final answer comes from an alternative incorrect method, eg $120 \div 5 (= 24)$ or $\Sigma mp \div \Sigma f (875 \div 120 (= 7.29\dots))$ or $\Sigma mp \div 5 (875 \div 5 (= 175))$														
	(b)	M1	for finding 5 products within the interval (including end points) with not more than one error, may be seen near table, eg $75 \times 34 (= 2550)$, $125 \times 29 (= 3625)$, $175 \times 27 (= 4725)$, $225 \times 19 (= 4275)$, $275 \times 11 (= 3025)$ or for 18200															
		M1	for $\Sigma fx \div \Sigma f$ eg $(\text{"2550"} + \text{"3625"} + \text{"4725"} + \text{"4275"} + \text{"3025"}) \div 120$ or $\text{"18200"} \div 120$															
		A1	for answer in the range 151 to 152	<table border="1"> <thead> <tr> <th>Min fx</th> <th>Max fx</th> </tr> </thead> <tbody> <tr> <td>1700</td> <td>3400</td> </tr> <tr> <td>2900</td> <td>4350</td> </tr> <tr> <td>4050</td> <td>5400</td> </tr> <tr> <td>3800</td> <td>4750</td> </tr> <tr> <td>2750</td> <td>3300</td> </tr> <tr> <td>15200</td> <td>21200</td> </tr> </tbody> </table> <p>Σfx must come from 5 products, fx within intervals (including end points)</p> <p>Correct midpoints must be used for the award of the A mark</p>	Min fx	Max fx	1700	3400	2900	4350	4050	5400	3800	4750	2750	3300	15200	21200
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