

S1 - Interpolation Questions

Question 1

June 05 @ 2

change class boundaries

Distance	f	c.f
40.5 - 45.5	4	4
45.5 - 50.5	19	23
50.5 - 60.5	53	76
60.5 - 70.5	37	113
70.5 - 90.5	15	128
90.5 - 150.5	6	134

Position of Median

$$\begin{aligned} \text{Position of Median} &= \frac{134}{2} \\ &= 67^{\text{th}} \end{aligned}$$

$$\text{Median} = \text{lower boundary} + \left( \frac{\text{Places into Group}}{\text{Group Frequency}} \times \text{Class Width} \right)$$

$$= 50.5 + \left( \frac{67-23}{53} \times 10 \right)$$

$$= 58.801$$

$$= 58.8 \text{ (3 S.F.)} \leftarrow$$

Question 2

Jan 07 @ 4

change class boundaries  $\Rightarrow$  no gaps between boundaries

Distance	f	c.f
0 - 9.5	10	10
9.5 - 19.5	19	29
19.5 - 29.5	43	72
29.5 - 39.5	25	97
39.5 - 49.5	8	105
49.5 - 59.5	6	111
59.5 - 69.5	5	116
69.5 - 79.5	3	119
79.5 - 89.5	1	120

Position of Median

$$\begin{aligned} \text{Position of Median} &= \frac{120}{2} \\ &= 60^{\text{th}} \end{aligned}$$

$$\text{Median} = \text{lower boundary} + \left( \frac{\text{Places into Group}}{\text{Group Frequency}} \times \text{Class Width} \right)$$

$$= 19.5 + \left( \frac{60-29}{43} \times 10 \right)$$

$$= 26.709 = 26.7 \text{ (3 S.F.)} \leftarrow$$

June 09 4 | Question 3

$10 \leq L < 12$	5	5
$12 \leq L < 17$	53	58
$17 \leq L < 19$	29	87
$19 \leq L < 21$	15	102
$21 \leq L < 23$	11	113
$23 \leq L < 25$	7	120

← Position of Median

$$\begin{aligned} \text{Position of Median} &= \frac{120}{2} \\ &= 60^{\text{th}} \end{aligned}$$

$$\text{Median} = 17 + \left( \frac{60 - 58}{29} \times 2 \right)$$

$$= 17.137$$

$$= 17.1 \text{ (3 s.f.)} \leftarrow$$

Jan 10 03 | Question 4

Weight	Midpoint $\bar{x}$	f	f.x	c.f
0.0-1.0	0.50	1	0.5	1
1.0-2.0	1.50	6	9	7
2.0-2.5	2.25	60	135	67
2.5-3.0	2.75	280	770	347
3.0-3.5	3.25	820	2665	1167
3.5-4.0	3.75	320	1200	1487
4.0-5.0	4.55	10	45.5	1497
5.0-6.0	5.50	3	16.5	1500
<del>8.0-8.5</del>	<del>8.25</del>	<del>1</del>	<del>8.25</del>	
Total		1500	4841.5	

$$a) \bar{x} = \frac{\sum f_x}{\sum f}$$

$$= \frac{4841.5}{1500}$$

$$= 3.227$$

$$= 3.23 \leftarrow$$

← Position of Median

$$b) \text{Median} = \left[ 3 + \left( \frac{750 - 347}{820} \right) \times 0.5 \right]$$

$$= 3.245$$

$$= 3.25 \text{ (3 s.f.)} \leftarrow$$