



Exercise 9D

Question 4:

Class	Frequency f_i	Mid-value x_i	$u_i = \left(\frac{x_i - A}{h}\right)$	$f_i u_i$	C.F.
100-120	12	110	-2	-24	12
120-140	14	130	-1	-14	26
140-160	8	150 = A	0	0	34
160-180	6	170	1	6	40
180-200	10	190	2	20	50
	N = 50			$\sum f_i u_i = -12$	

Let assumed mean $A = 150$ and $h = 20$

$$(i) \text{ Mean} = A + h \left(\frac{\sum f_i u_i}{N} \right) = 150 + 20 \times \left(\frac{-12}{50} \right)$$

$$= 150 - \frac{24}{5} = 150 - 4.8 = 145.2$$

$$(ii) N = 50, \frac{N}{2} = \frac{50}{2} = 25$$

Cumulative frequency just after 25 is 26

\therefore Corresponding frequency median class is 120 - 140

$$\text{So, } l = 120, f = 14, \frac{N}{2} = 25, h = 20, c = 12$$

$$\therefore \text{Median} = l + h \left(\frac{\frac{N}{2} - c}{f} \right) = 120 + 20 \left(\frac{25 - 12}{14} \right)$$

$$= 120 + \frac{20 \times 13}{14} = 120 + \frac{130}{7} = 120 + 18.6 = 138.6$$

$$(iii) \text{ Mode} = 3 \times \text{Median} - 2 \times \text{Mean}$$

$$= 3 \times 138.6 - 2 \times 145.2$$

$$= 415.8 - 290.4$$

$$= 125.4$$

Hence, Mean = 145.2, Median = 138.6 and Mode = 125.4

***** END *****