Exercise 9D

Question 2:

Let assumed mean A be 8.5. Class interval h = 3

Class	Frequency f_i	Mid-value x_i	$u_i = \left(\frac{x_i - A}{h}\right)$	f_iu_i	C.F.
1-4	6	2.5	-2	-12	6
4-7	30	5.5	-1	-30	36
7-10	40	8.5 = A	0	0	76
10-13	16	11.5	1	16	92
13-16	4	14.5	2	8	96
16-19	4	17.5	3	12	100
	N = 100			$\Sigma f_iu_i = -6$	

N = total frequency = 100

(i) Mean $\bar{x} = A + h\left(\frac{\Sigma f_iu_i}{N}\right)$

$= 8.5 + 3 \times \frac{-6}{100} = 8.5 - \frac{18}{100}$

$= 8.5 - 0.18 = 8.32$

(ii) $\frac{N}{2} = 50$, Cumulative frequency just after 50 is 76

$\therefore$ Median class is 7 - 10

$\therefore$ l = 7, h = 3, N = 100, f = 40, c = 36

$$\text{Median } M_e = l + h\left(\frac{\frac{N}{2} - c}{f}\right) = 7 + 3 \times \left(\frac{50 - 36}{40}\right)$$

$$= 7 + 3 \times \frac{14}{40} = 7 + \frac{21}{20} = 7 + 1.05 = 8.05$$

(iii) Mode = 3 × Median - 2 × Mean
= 3 × 8.05 - 2 × 8.32 = 24.15 - 16.64
= 7.51
Thus, mean = 8.32, Median = 8.05, Mode = 7.51

********** END **********