

Q	Age Group	0-9	10-19	20-29	30-39	40-49	50-59
	males	25	60	100	220	150	45

Sol

Calculation of arithmetic mean by direct method

Age group (C.I)	males (f)	mid value (x)	Product (fx)
0-9	25	4.5	112.5
10-19	60	14.5	870.5
20-29	100	24.5	2450
30-39	220	34.5	7590
40-49	150	44.5	6675
50-59	45	54.5	2452.5
	N=600		fx=20148

$$\therefore \text{Mean} = \frac{\sum fx}{\sum f} = \frac{20148}{600} = 33.58$$

\therefore Mean age of the series is 33.58

8

CS	0-10	10-20	20-30	30-40
f	1	3	x	2

given mean = 22

Calculation of arithmetic mean by direct method

C.I	Frequency (f)	mid value (x)	Product (f x x)
0-10	1	5	5
10-20	3	15	45
20-30	x	25	25x
30-40	2	35	70
	$\Sigma f = 6+x$		$\Sigma fx = 120 + 25x$

$$\text{Mean} = \frac{\Sigma fx}{\Sigma f}$$

$$22 = \frac{120 + 25x}{6+x}$$

$$\Rightarrow 22(6+x) = 120 + 25x$$

$$\Rightarrow 132 + 22x = 120 + 25x$$

$$\Rightarrow 132 - 120 = 25x - 22x$$

$$\Rightarrow 12 = 3x$$

9

$$\therefore \frac{2 \times 124}{3}$$

C.P	0	1	2	3	4	5
f	46	76	38 25	25	10	5

given mean = 1.46

mid value (x)	Frequency (f)	Product (fx)
0	46	0
1	76	76
2	38	38x
3	25	75
4	10	40
5	5	25
	$\Sigma f = 200$	$\Sigma fx = 216 + 38x$

$$\therefore \text{mean} = \frac{\Sigma fx}{\Sigma f}$$

$$1.46 = \frac{216 + 38x}{200}$$

$$\Rightarrow \frac{1.46 \times 200}{100} = \frac{216 + 38x}{100}$$

$$\Rightarrow 292 = 216 + 38x$$

$$2) \frac{26^2}{38} = n$$



$$\therefore n = 2.$$

~~Ex 2.1~~

Shortcut method (individual series)

Q. In a Carnival 10 ladies ate lollipops as follow:-

no. of ladies	1	2	3	4	∴
no. of lollipops	3	4	5	8	

find the average no. of lollipops eating by a lady.

calculation of Arithmetic mean by short cut method

NO. of lollipops (Class Interval) (x)	no. of ladies (Frequency) (f)	deviation from A (x - A)	Product (fd)
3	1	3 - 5 = -2	-2
4	2	4 - 5 = -1	-2
5 - A	3	5 - 5 = 0	0
8	4	8 - 5 = 3	12
	$\Sigma f = 10$		$\Sigma fd = 8$

$\therefore \text{Mean} = A + \frac{\Sigma fd}{\Sigma f}$

12

$\Rightarrow 5 + \frac{8}{10}$

$\Rightarrow \frac{50 + 8}{10} = \frac{58}{10} = 5.8$

Calculation of Arithmetic mean by direct method

x	f	Product(fx)
3	1	3
4	2	8
5	3	15
8	4	32
	$\Sigma f = 10$	$\Sigma fx = 58$

$$\text{mean} = \frac{\Sigma fx}{\Sigma f}$$

$$\Rightarrow \frac{58}{10} = 5.8$$

13

Q

Size of the item	0-10	10-20	20-30	30-40	40-50
Frequency	1	3	6	2	3

Sol Calculation of Arithmetic mean by shortcut method

Size of the item (C.P)	mid value (m)	Frequency (f)	$dx = m - 25$	Product (fdx)
0-10	5	1	-20	-20
10-20	15	3	-10	-30
20-30	25-A	6	0	0
30-40	35	2	10	20
40-50	45	3	20	60
		$\Sigma f = 15$		$\Sigma fdx = 20$

$\therefore \text{Mean} = A + \frac{\Sigma fdx}{\Sigma f}$

$\Rightarrow 25 + \frac{20}{15} = 27$

\therefore The mean size of the item is 27.

14

Direct method
Individual series:-

Q1 Find out the mean from the following data:
Income RS. 50, 100, 200, 500, 2000, 3,000, 4,000

Sol $\therefore \text{Mean}(\bar{x}) = \frac{\text{Sum of observations}(\Sigma f_i x_i)}{\text{No. of observations}(\Sigma f_i)}$

$\Rightarrow \frac{50 + 100 + 200 + 500 + 2000 + 3000 + 4000}{7}$

$\Rightarrow \frac{9850}{7}$

$\Rightarrow \text{RS. } 1407.14$

* \therefore The mean income is RS. 1407.14.

Q2 Calculate the simple arithmetic mean of the following numbers:
28, 34, 39, 42, 50, 53, 54, 59

Sol $\therefore \text{Mean}(\bar{x}) = \frac{\text{Sum of observations}(\Sigma f_i x_i)}{\text{No. of observations}(\Sigma f_i)}$

$\Rightarrow \frac{28 + 34 + 39 + 42 + 50 + 53 + 54 + 59}{8}$

$\Rightarrow \frac{359}{8} = 44.875$

DATE _____
Page _____

$$\therefore \text{mean}(\bar{x}) = 44.875$$

③ Find the mean of 14, 3, 0, 4, 5, 6.

Sol

$$\therefore \text{mean}(\bar{x}) = \frac{\text{sum of observations}(\Sigma f_i x_i)}{\text{no. of observations}(\Sigma f_i)}$$

$$\Rightarrow \frac{14 + 3 + 0 + 4 + 5 + 6}{6}$$

$$\Rightarrow \frac{32}{6}$$

$$\Rightarrow 5.3$$

$$\therefore \text{mean}(\bar{x}) = 5.3$$

④ Calculate the mean of the following data:-

S.No.:-	1	2	3	4	5	6	7	8	9	10	11	12
size:-	96	180	98	75	270	80	102	100	94	75	200	610

16

sol

Calculation of Arithmetic mean
(by direct method)

S.NO (mid value) (x)	Size (frequency) (f)	Product (f × x)
1	96	96
2	180	360
3	98	294
4	75	300
5	270	1,350
6	80	480
7	102	714
8	100	800
9	94	846
10	75	750
11	200	2,200
12	610	7,320
	$\Sigma f = 1,980$	$\Sigma fx = 15,510$

$$\therefore \text{mean} = \frac{\Sigma fx}{\Sigma f}$$

$$\Rightarrow \frac{15,510}{1,980} = 7.83$$

\therefore The mean size is 7.83

17