Exercise 11.1

Unit 11 · Basic Statistics

1 **Answer the questions from the frequency table of readers.**

Class interval	1–10	11–20	21–30	31–40	41–50	51–60
No. of readers (f)	5	4	8	9	2	2

(i) Total number of readers = 5 + 4 + 8 + 9 + 2 + 2

∴ 30

(ii) Group with the highest number of readers (f = 9):

∴ 31–40

(iii) Groups with the least number of readers (f = 2):

∴ 41–50 and 51–60

(iv) Lower limit of the class 51–60 = **51**

(v) Lower class boundary of 51–60 = 51 − 0.5 = **50.5**

(vi) Size of the class interval = 10.5 − 0.5 = **10**

(vii) Class mark = $\frac{\text{lower limit + upper limit}}{2}$, e.g. $\frac{1 + 10}{2} = 5.5$

∴ Class marks: 5.5, 15.5, 25.5, 35.5, 45.5, 55.5

2 **Make a frequency table with tally marks and cumulative frequency for the marks of 80 students.**

(i) Frequency table

Class interval	Tally marks	Frequency (f)	Cumulative frequency
40–49	𝍸 ||	7	7
50–59	𝍸 𝍸 |||	13	7 + 13 = 20
60–69	𝍸 𝍸 𝍸 𝍸 ||	22	20 + 22 = 42
70–79	𝍸 𝍸 𝍸 ||	17	42 + 17 = 59
80–89	𝍸 𝍸 |||	13	59 + 13 = 72
90–99	𝍸 |||	8	72 + 8 = 80
	Total	**$\Sigma f = 80$**	

(iii) Students in the first three classes (40–69) = 7 + 13 + 22 = **42**

(iv) Percentage of students in 40–49 = $\frac{7}{80} \times 100\%$

$\therefore$ 8.75%

(v) Class with the highest frequency (22): **60–69**

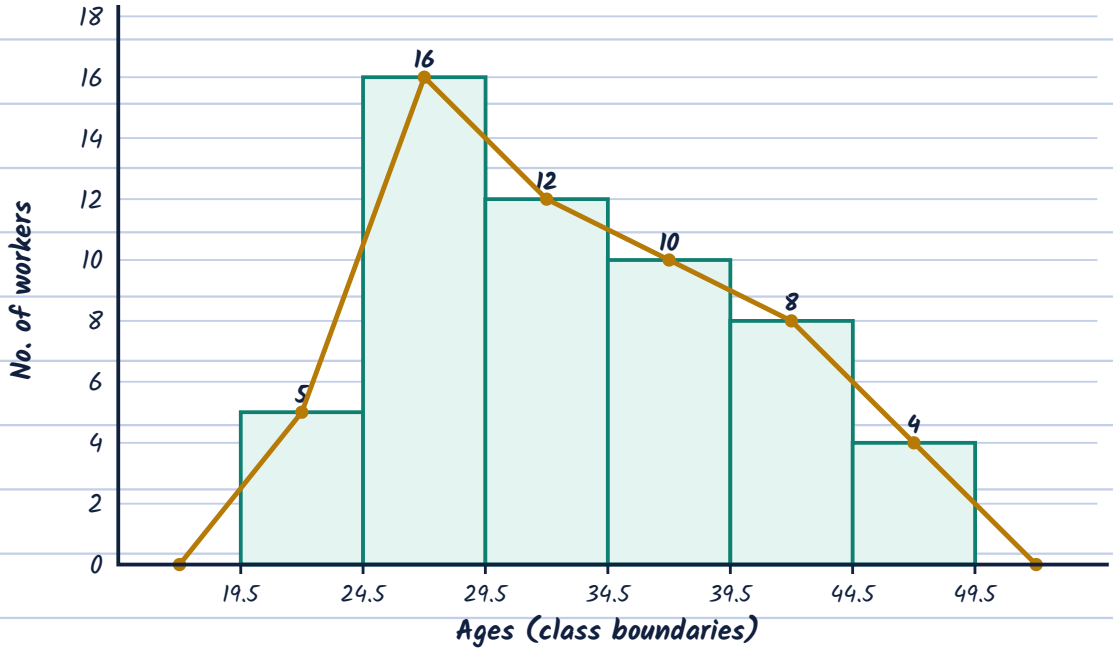
(vi) Size of the class interval = **10**

3 **Make a cumulative frequency table for the number of medals won.**

Medals won	Frequency (f)	Cumulative frequency
0	5	5
1	8	5 + 8 = 13
2	10	13 + 10 = 23
3	8	23 + 8 = 31
4	5	31 + 5 = 36
5	5	36 + 5 = 41
6	4	41 + 4 = 45

4 **Draw a histogram and a frequency polygon for the ages of workers.**

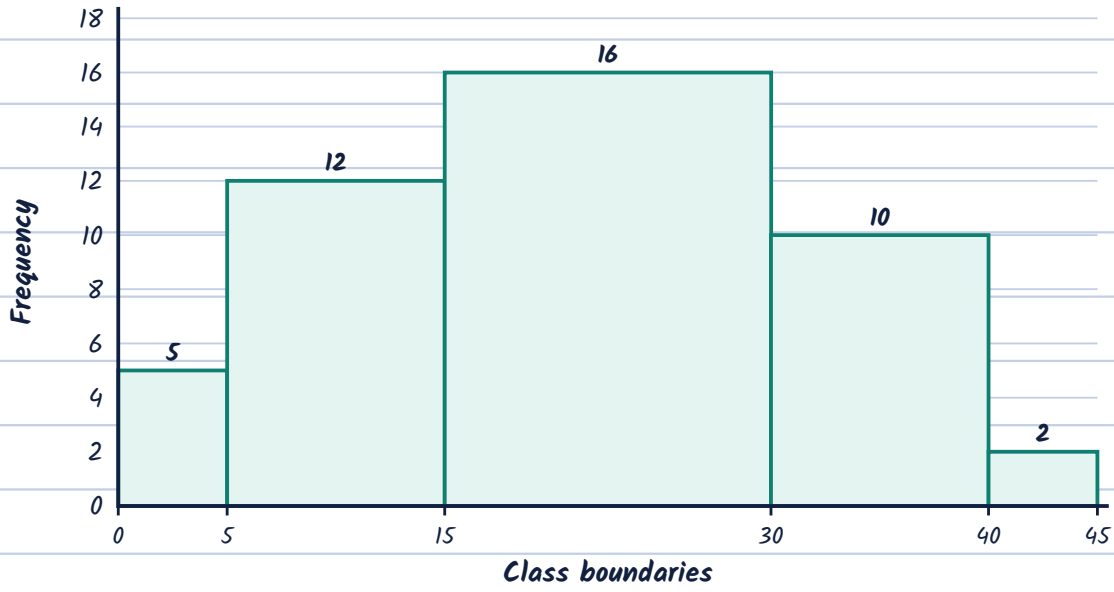
Ages	No. of workers (f)	Class boundaries
20–24	5	19.5 – 24.5
25–29	16	24.5 – 29.5
30–34	12	29.5 – 34.5
35–39	10	34.5 – 39.5
40–44	8	39.5 – 44.5
45–49	4	44.5 – 49.5



The frequency polygon (gold) joins the midpoints of the tops of the bars, and is closed at the class marks 17 and 52 on the x-axis.

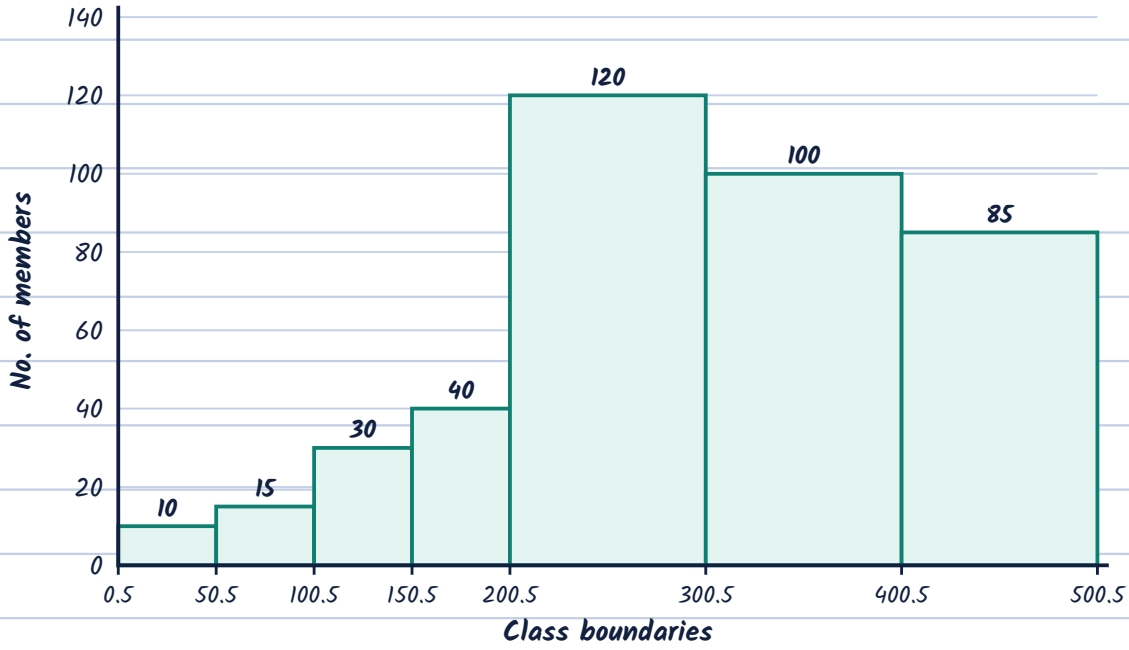
5 Draw a histogram for the given data.

Class	0–5	5–15	15–30	30–40	40–45
Frequency (f)	5	12	16	10	2



6 Draw a histogram for the number of members.

Class interval	No. of members (f)	Class boundaries
1–50	10	0.5 – 50.5
51–100	15	50.5 – 100.5
101–150	30	100.5 – 150.5
151–200	40	150.5 – 200.5
201–300	120	200.5 – 300.5
301–400	100	300.5 – 400.5
401–500	85	400.5 – 500.5



In Q5 and Q6 the classes are not all the same width; the bars here are drawn with height = frequency, as in the notes.

7 **Answer the questions from the table of states and their incomes.**

Income	9–11	11–13	13–15	15–17	17–19	19–21	21–23
States (f)	8	9	13	10	5	2	1

(i) Total number of states $= 8 + 9 + 13 + 10 + 5 + 2 + 1$

$\therefore 48$

(ii) Number of states in the lowest class (9–11) = **8**

(iii) Only **one** state is in the highest class (21–23).

(iv) Percentage of states $= \frac{13 + 10}{48} \times 100\% = \frac{23}{48} \times 100\%$

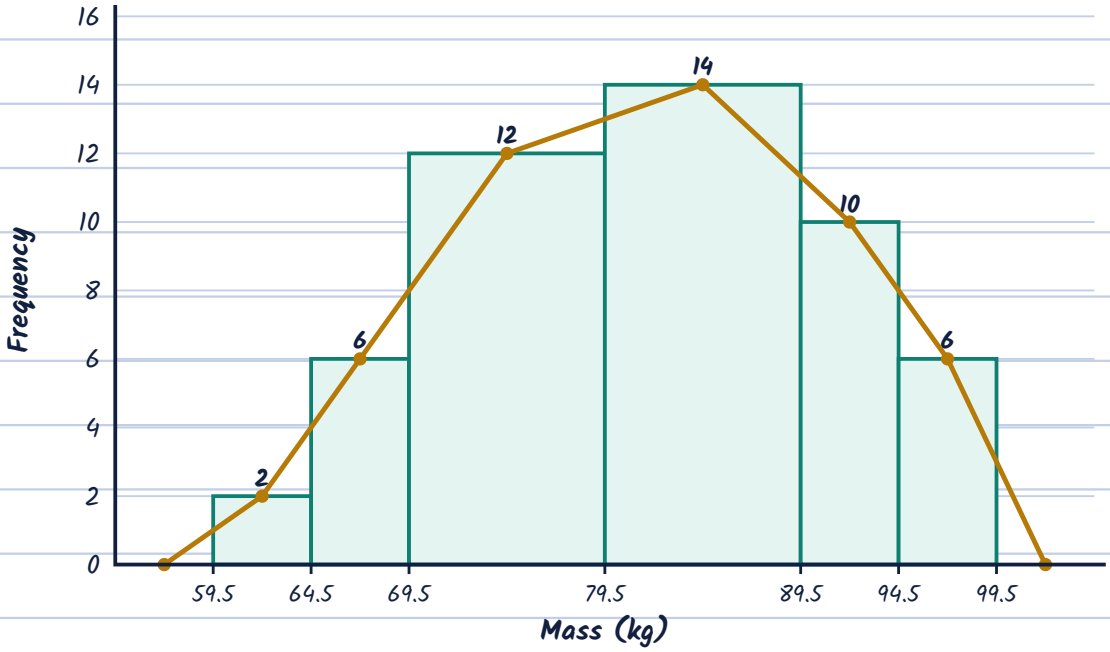
$\therefore 47.92\% \approx 48\%$

(v) Number of states $= 5 + 2 + 1 = 8$

(vi) The frequency table is shown above.

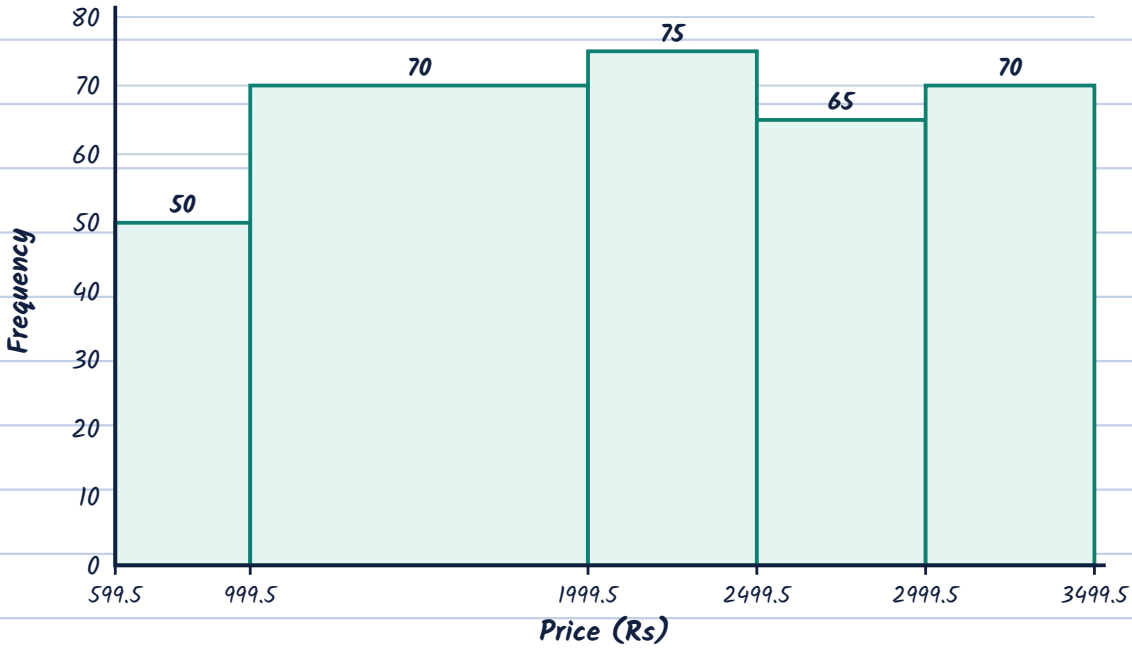
8 Draw (i) a histogram and (ii) a frequency polygon for the masses.

Mass (kg)	f	Class boundaries
60–64	2	59.5 – 64.5
65–69	6	64.5 – 69.5
70–79	12	69.5 – 79.5
80–89	14	79.5 – 89.5
90–94	10	89.5 – 94.5
95–99	6	94.5 – 99.5



9 Draw a histogram for the prices.

Price (Rs)	f	Class boundaries
600–999	50	599.5 – 999.5
1000–1999	70	999.5 – 1999.5
2000–2499	75	1999.5 – 2499.5
2500–2999	65	2499.5 – 2999.5
3000–3499	70	2999.5 – 3499.5


80
70
60
50
40
30
20
10
0
Frequency
50
70
75
65
70
599.5
999.5
1999.5
2499.5
2999.5
3499.5
Price (Rs)