Data Presentations (2)

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Important of graphs

1. Graphs are more attractive than tables of data

2. Make a clear impression in mind

3. A graph gives a bird's eye view of the entire data

4. Easy comparison among two or more data sets

5. Easy to interpret

Limitations of graphs

1. Amount of details is reduced

2. We cannot always compute precise estimates of the data sets

Types of Graphs

- Graphs for Quantitative data

- Graphs for Qualitative data

Graphs for Quantitative

- Common methods for graphically displaying quantitative data are

1. Histogram
2. Frequency polygon
3. Frequency curve
4. Ogive curve
5. Stem and Leaf plot

Histogram

1. Firstly, we need to create a frame work (that is, X axis and Y axis)

2. Mark the distinct class boundary value in X-axis

3. Mark the frequencies in the Y-axis

4. Draw a rectangle above each class whose height equals to the frequency of that class.

5. Label the axis.

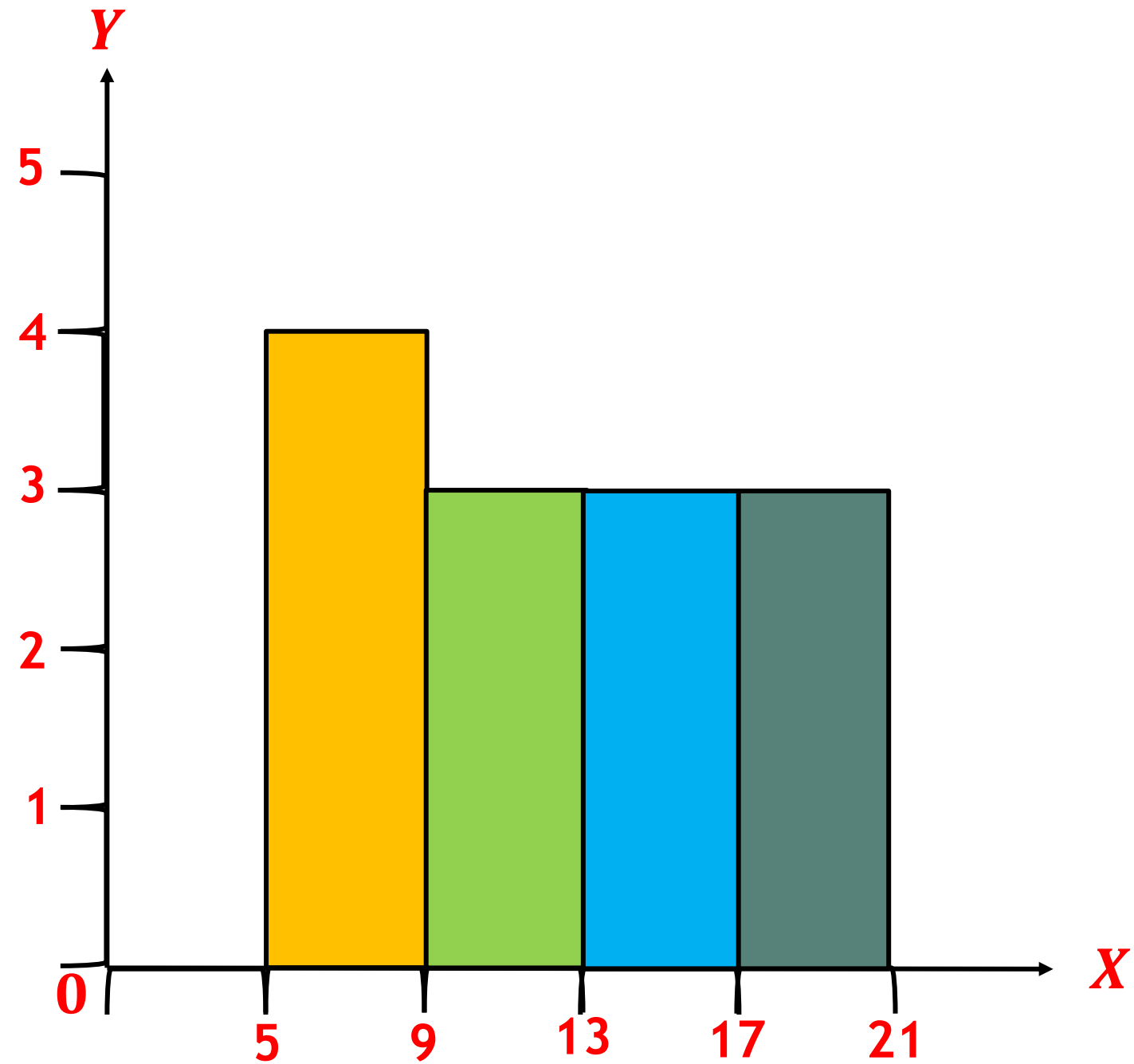# Histogram

- Hypothetical data set:

    17, 8, 12, 19, 14, 6, 10, 15, 7, 18, 11, 16, 8

a) Construct the frequency distribution table.

b) Construct the histogram for the data.

Histogram

Class	Tally	Frequency
5-9	I I I I	4
9-13	I I I	3
13-17	I I I	3
17-21	I I I	3

Histogram

No of children	f_i
0	3
1	7
2	12
3	19
4	5
5	4

Computer sold	f_i
20-29	4
30-39	11
40-49	9
50-59	7
60-69	5
70-79	4

Expenditure	f_i
48-58	4
58-68	8
68-73	5
73-78	5
78-98	28

Frequency Polygon

1. Firstly, we need to create a frame work (that is, X axis and Y axis)

2. Mark the distinct class mid value in X-axis

3. Mark the frequencies in the Y-axis

4. Plot a point above each mid value at the height equal to the frequency of that class

5. Label the axis.

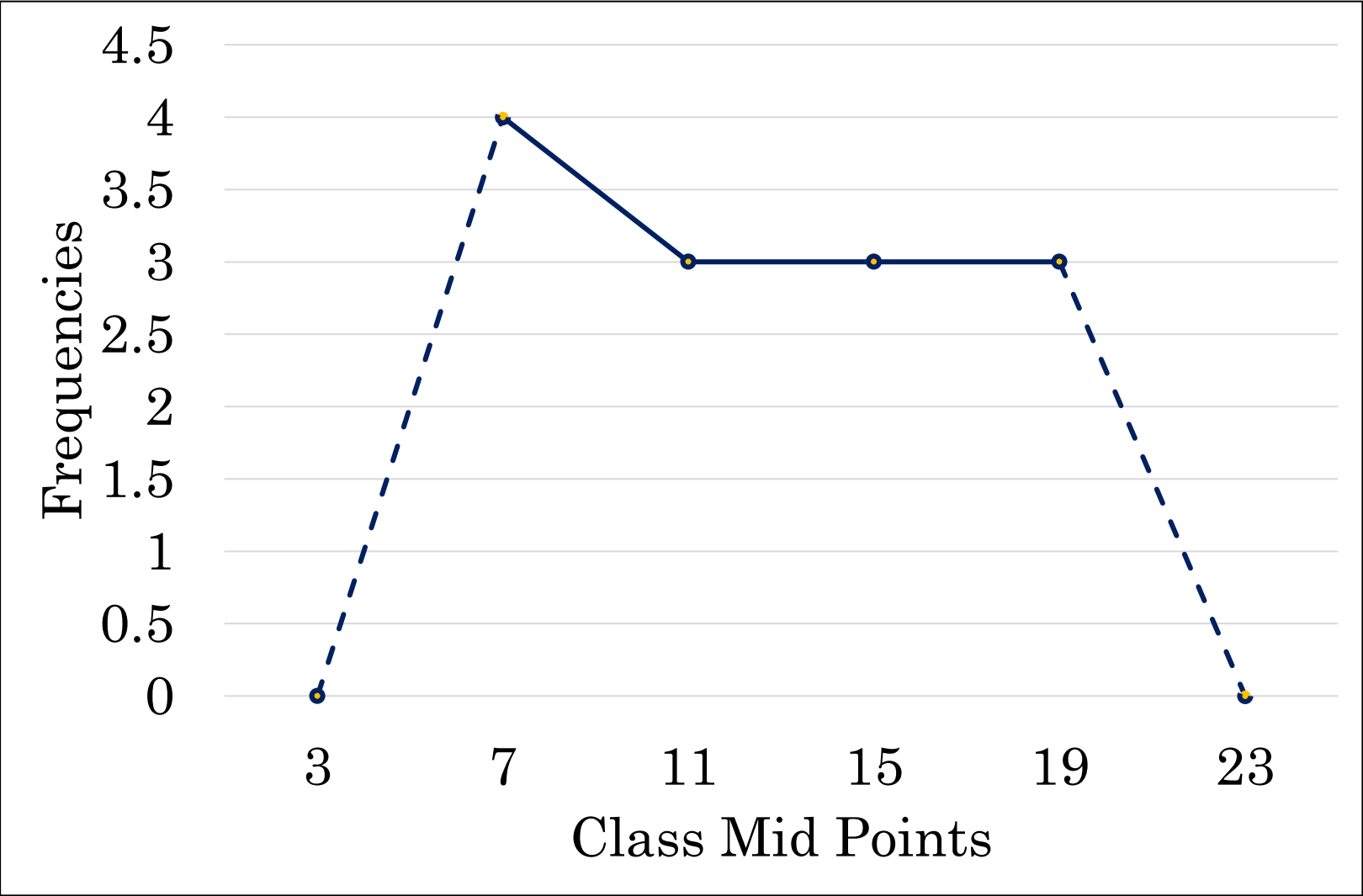# Frequency Polygon

- Hypothetical data set:

    17, 8, 12, 19, 14, 6, 10, 15, 7, 18, 11, 16, 8

a) Construct the frequency distribution table.
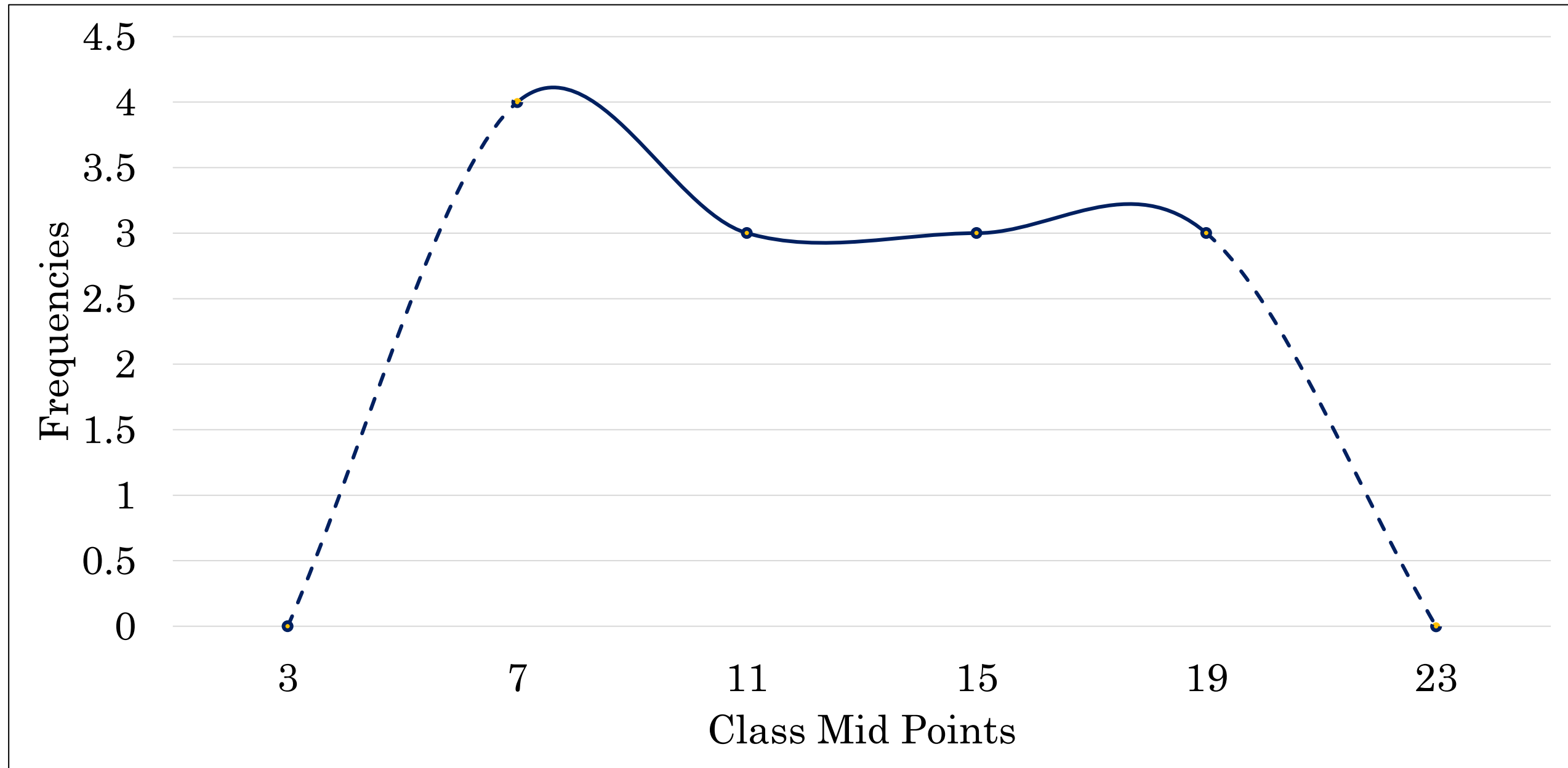
b) Construct the frequency polygon for the data.

Frequency Polygon

Class	Mid value	Frequency
5-9	7	4
9-13	11	3
13-17	13	3
17-21	19	3

Frequency Curve

Some points

- The histogram is more often used when single distributions are presented.

- The frequency polygon is largely used for comparison of two or more distribution.

Class work

- Given below the frequency distributions of heights (in cm) of male and female students of CSE department of BRAC University.

Height	105-115	115-125	125-135	135-145	145-155	155-165	165-175	Total
Male	5	6	8	19	10	7	5	60
Female	7	10	18	8	6	2	*	**
* Last digit of your ID; ** Sum of all female students								

1. Calculate relative frequency, cumulative frequency.

2. Draw comparative frequency polygon using frequency.

3. Draw comparative frequency polygon using Relative frequency.

Ogive curve

1. Firstly, we need to create a frame work (that is, X axis and Y axis)

2. Mark the distinct class boundary in X-axis

3. Mark the cumulative frequency in the Y-axis

4. Plot a point above each upper boundary (for less than type) at a height equal to the cumulative frequency of that class

5. Label the axis

Ogive Curve

- Hypothetical data set:

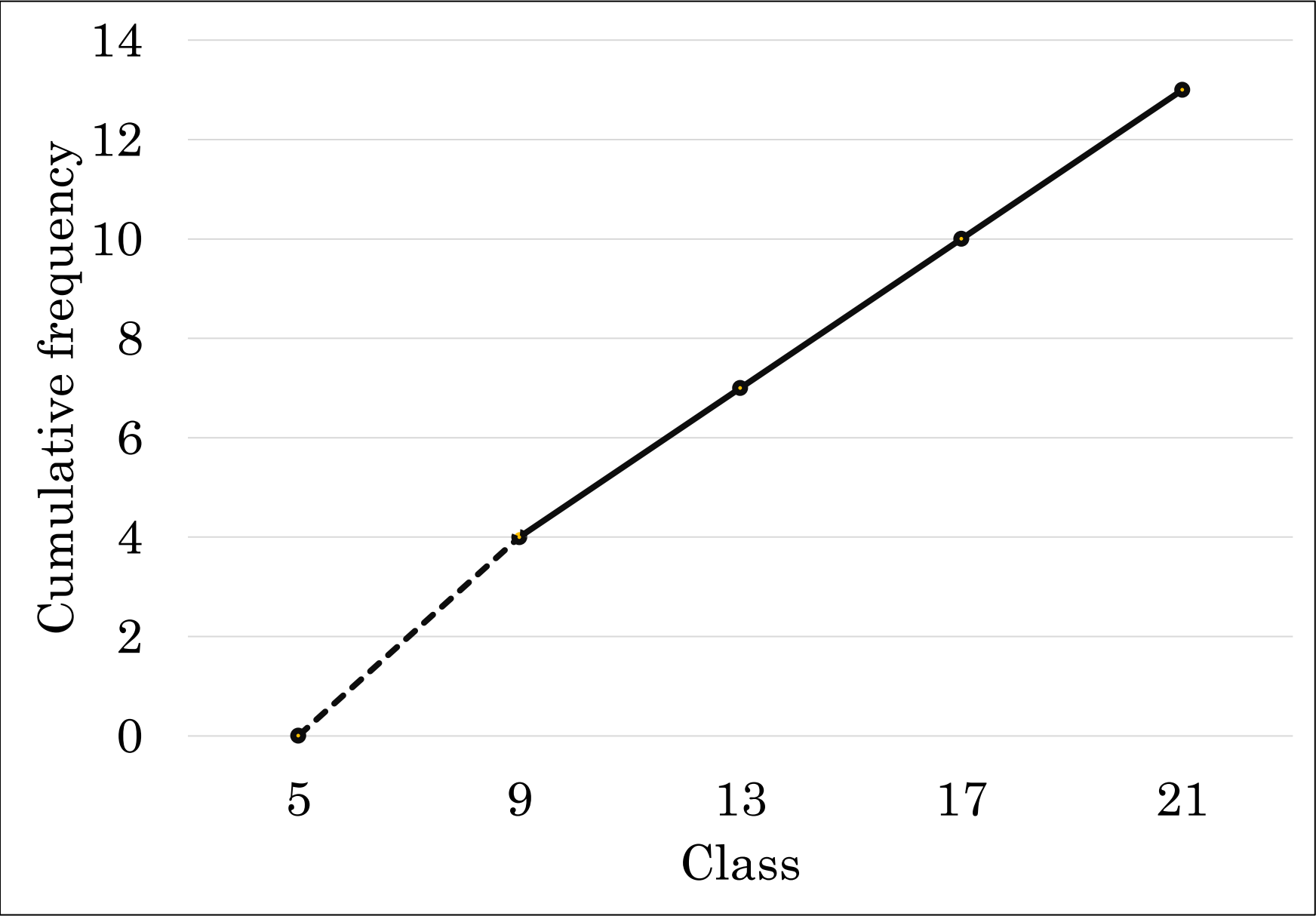 17, 8, 12, 19, 14, 6, 10, 15, 7, 18, 11, 16, 8

a) Construct the frequency distribution table.

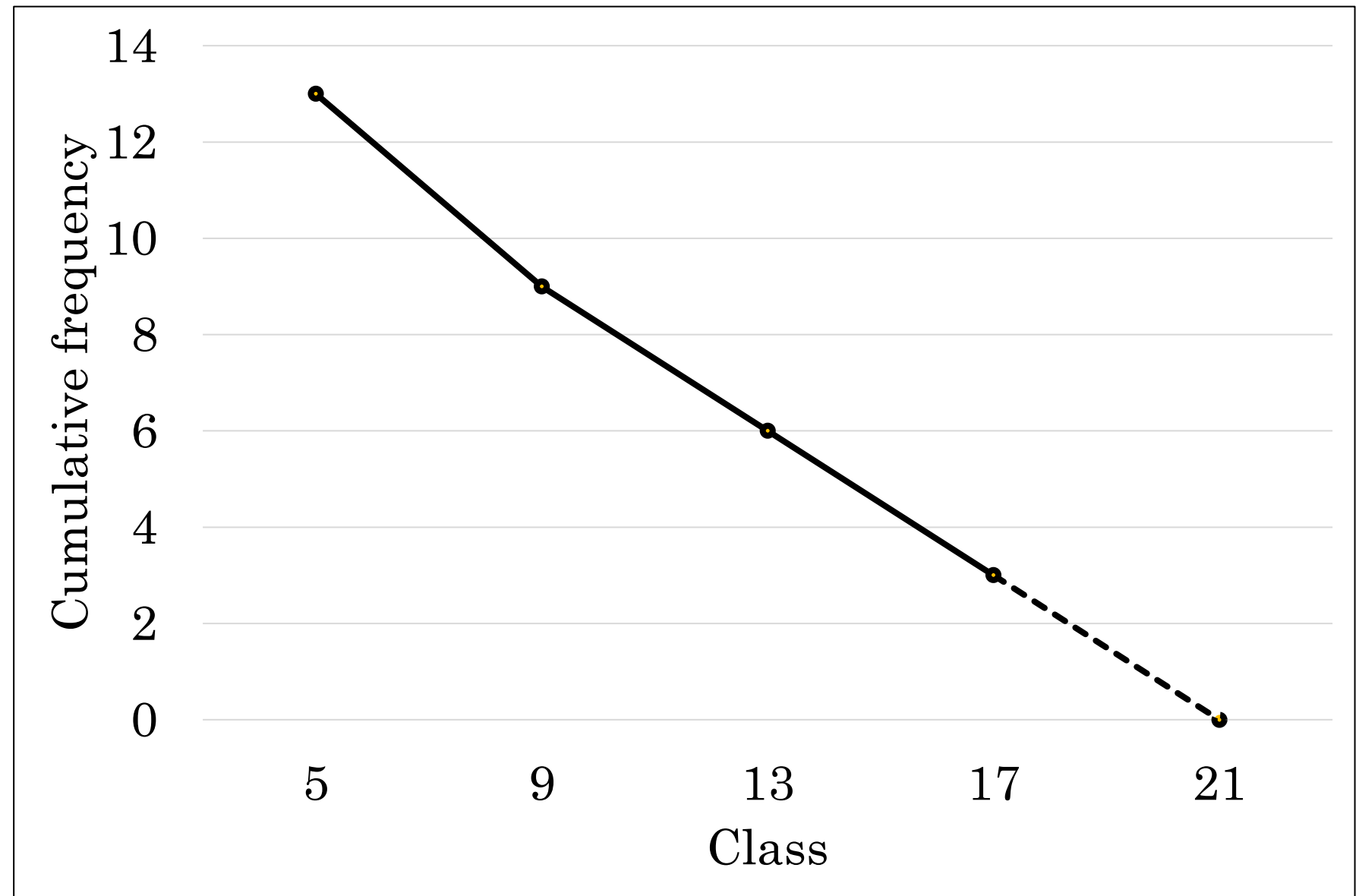b) Construct the ogive curve for the data.

Ogive Curve

Class	Frequency	CF_i
5-9	4	4
9-13	3	7
13-17	3	10
17-21	3	13

Ogive Curve

Class	Frequency	CF_i
5-9	4	13
9-13	3	9
13-17	3	6
17-21	3	3

Exercise

No of children	f_i
0	3
1	7
2	12
3	19
4	5
5	4

Computer sold	f_i
20-29	4
30-39	11
40-49	9
50-59	7
60-69	5
70-79	4

Expenditure	f_i
48=58	4
58-68	8
68-73	5
73-78	5
78-98	28

Stem and Leaf plot

- The stem and leaf plot is a simple device to construct a histogram-like picture of a frequency distribution.

Stem

Leaf

84

Stem=8   Leaf=4
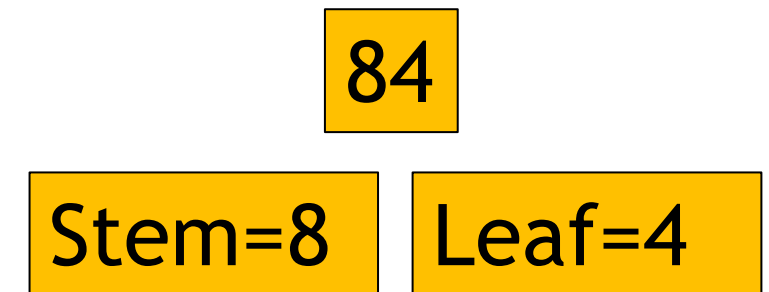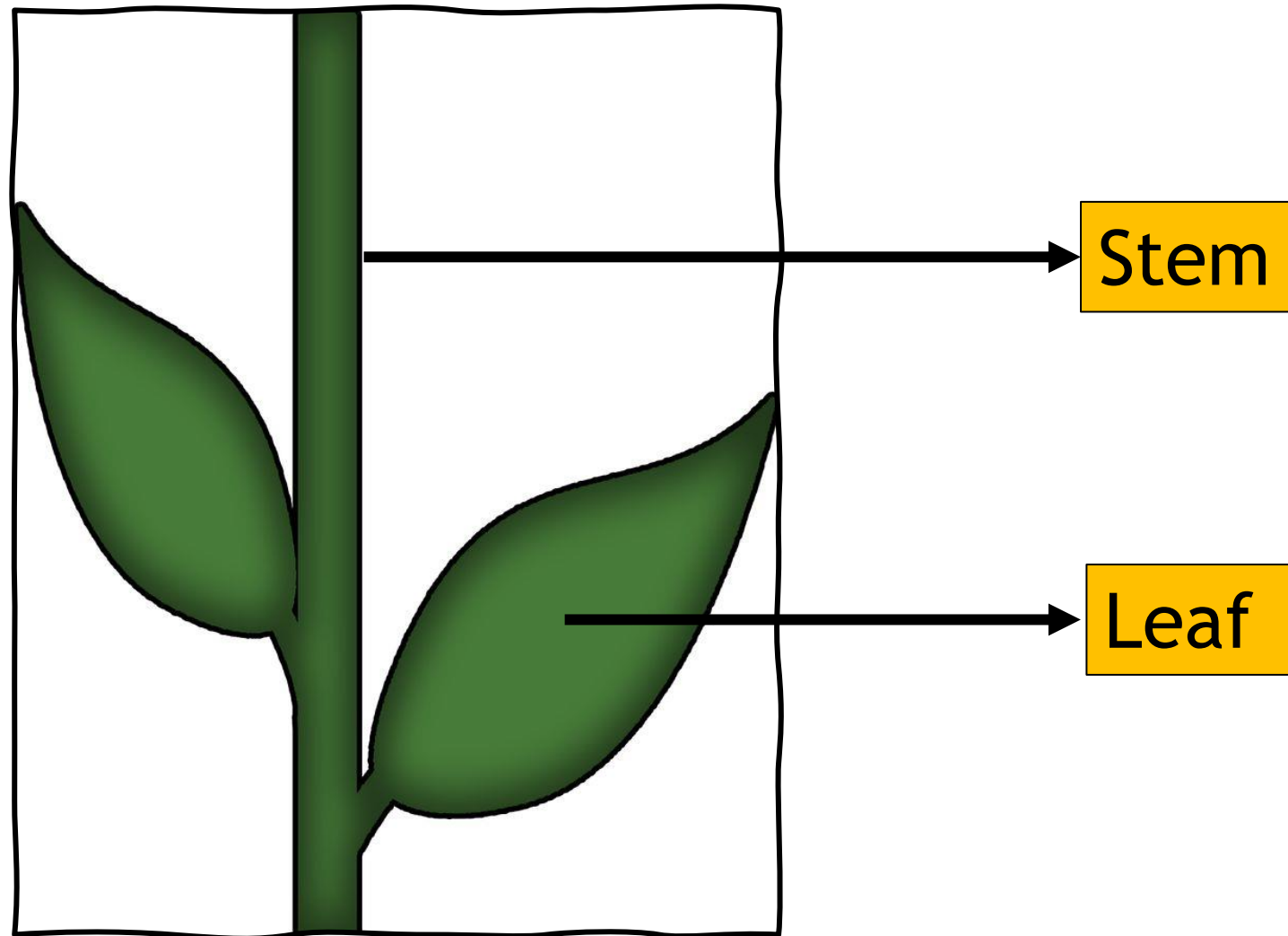
Stem and Leaf

- Hypothetical data set:

    12, 23, 19, 6, 10, 7, 15, 25, 21, 12

a) Construct the stem and leaf for the data.

0	67
1	29052
2	351

➡

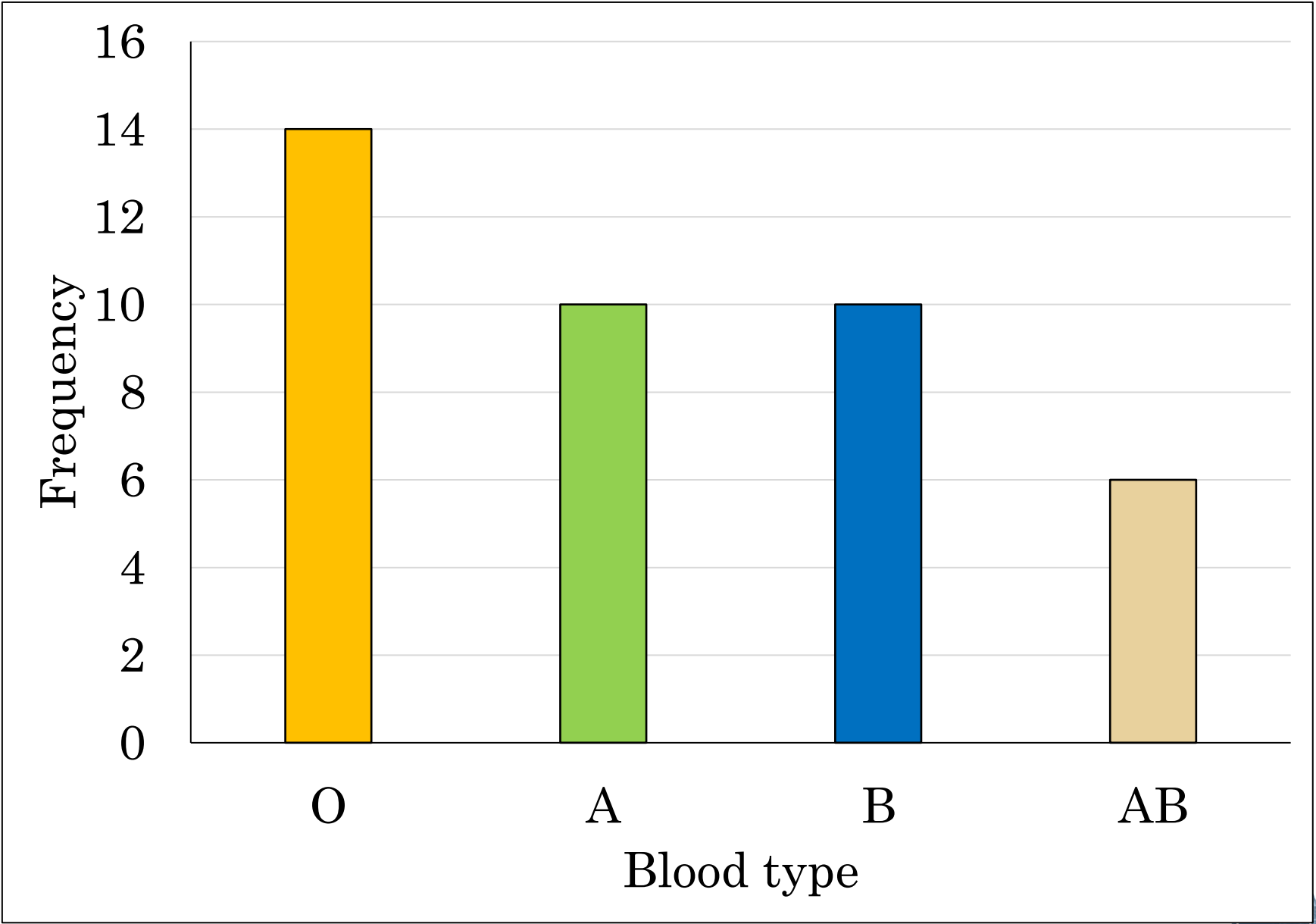| 0	67
1	02259
2	135

Graphs for Qualitative

- Common methods for graphically displaying quantitative data are

1. Bar Chart
2. Pie Chart

Bar Chart

Blood type	Frequency	Relative frequency
O	14	14/40=0.35
A	10	10/40=0.25
B	10	0.25
AB	6	0.15
Total	40	1.00

Pie Chart

Blood type	Frequency	Relative frequency
O	14	14/40=0.35
A	10	10/40=0.25
B	10	0.25
AB	6	0.15
Total	40	1.00
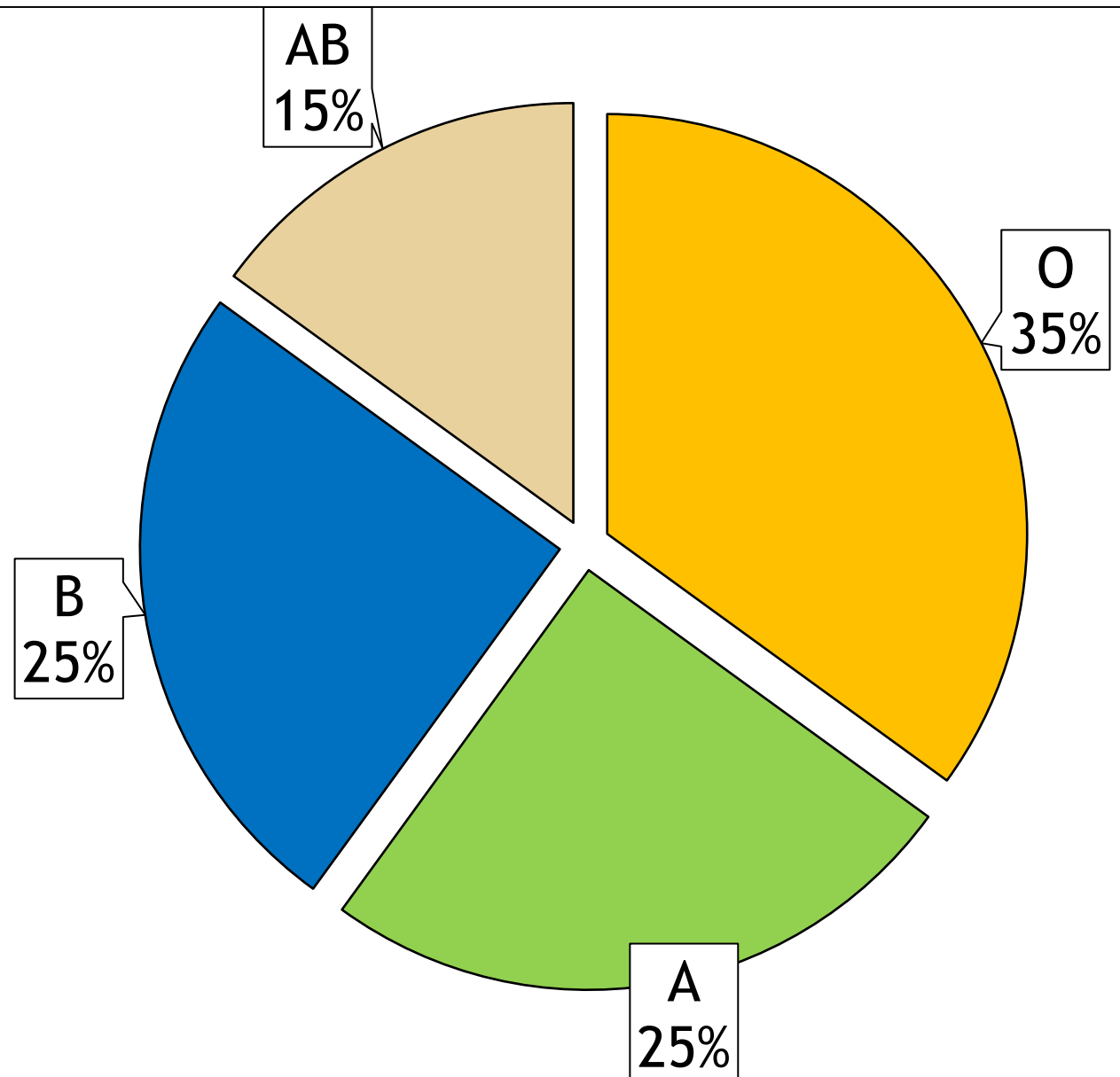
Class work

Gender	Eye Condition		
	Near Sighted	Far Sighted	Need Bifocals
Male	12	40	12
Female	12	48	36

Bar chart of gender by Eye condition

Bar chart of eye condition by gender

Bar chart vs Histogram

- Histogram refers to a graphical representation; that displays data by way of bars to show the frequency of numerical data.

- A bar graph is a pictorial representation of data that uses bars to compare different categories of data.

Mathematical exercise

To access additional mathematical problems, please refer to the PDF lecture notes.

Thank You