

# Statistic for Educational Research MPU1034

## Topic 2 : Frequency Distribution

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Regular frequency distribution  
Grouped Frequency  
Distributions  
Histogram  
Polygons  
Interpolation  
Percentile rank  
Percentile

# Frequency Distributions

- **Descriptive statistical techniques** should be performed by the researcher after collecting data to organize the data in order to get a general picture of the results.
- A frequency distribution is a method for organizing the data.

# Frequency Distributions (2)

- Frequency distribution is a summary of data that shows frequency or numbers according to the scale of measurement.
- A **frequency distribution** is the distribution of values that provide an overview of the sample.



# Frequency Distribution Tables

- The table has two columns:  
**Column X** represent list of categories on a scale of measurement ( $X$ )
- **Column Y** to represent the numbers of frequency of each  $X$ .
- The sum of the frequencies should be equal to  $N$ , sample size

# Frequency Distribution Tables (2)

- Other columns can be added;
- The third column represent the proportion ( $p$ ) for each category:  $p = f/N$ . The sum of the  $p$  column must be equal to 1.00.
- The fourth column represent percentage distribution that correspond to each value of  $X$ . The percentage is obtained by multiplying  $p$  by 100. The total percentage is 100.

# Regular Frequency Distribution

A **regular frequency distribution table** list all the  $X$  values.

# Grouped Frequency Distribution

- Sometimes the set of score has a long list of  $X$  values , so it should be simplified by using a **grouped frequency distribution** table.
- In this table,  $X$  column called as class intervals, not individual values.
- Class intervals should be in the same range such as 2, 5, 10 and etc.



# Frequency Distribution Graphs

- A frequency distribution graph have score categories ( $X$  values) on the  $X$  axis and the frequencies on the  $Y$  axis.
- The shape of graph depend on the score categories.
- When the scores are of an interval or ratio scale, the graph will be a **histogram** or a **polygon**.

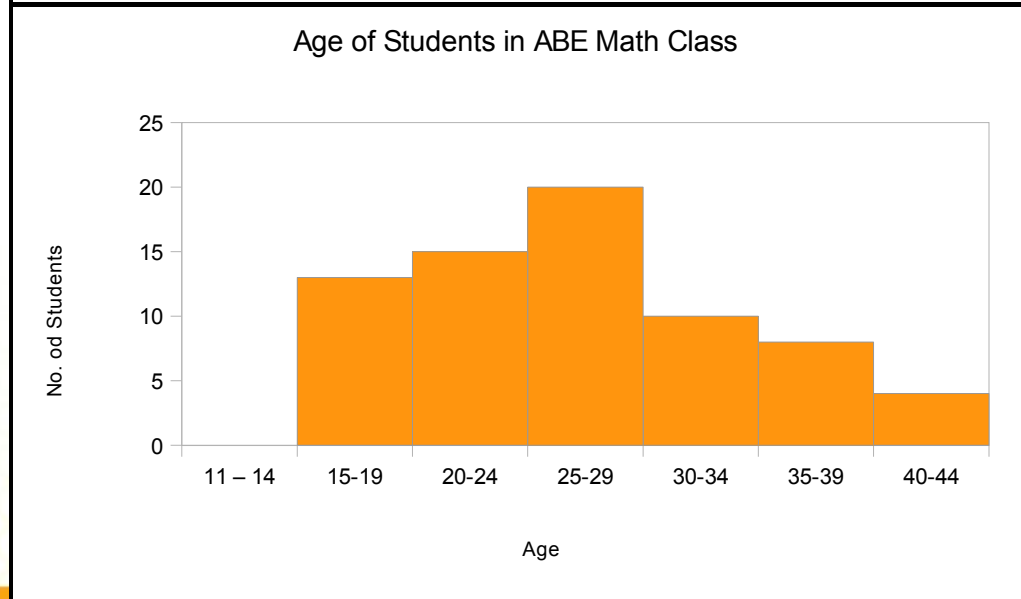
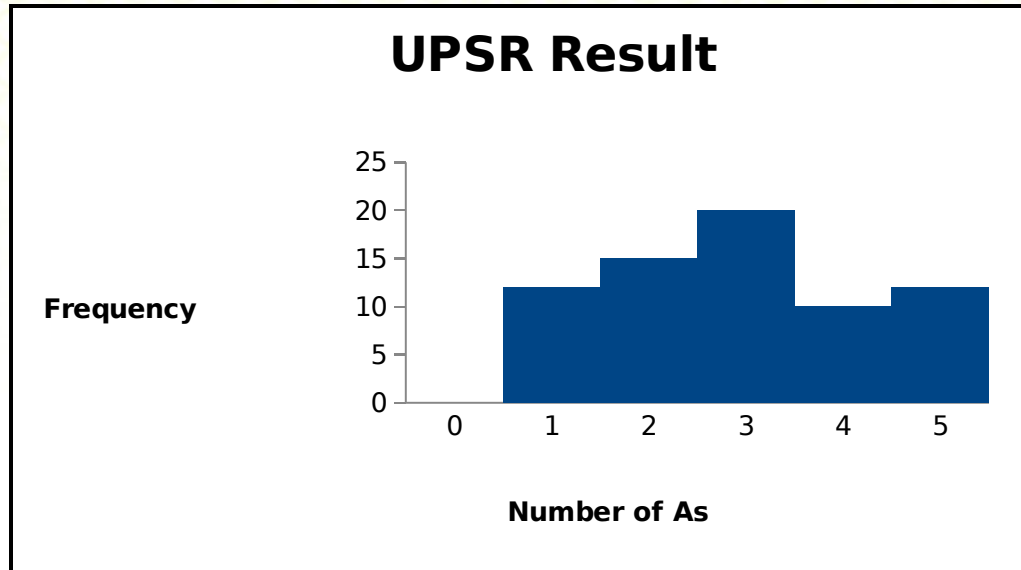
# Histograms

A histogram consists of tabular frequencies, shown as adjacent rectangles, erected with an area equal to the frequency of the observations in the interval. The height of a rectangle is also equal to the frequency density of the interval. The total area of the histogram is equal to the number of data.

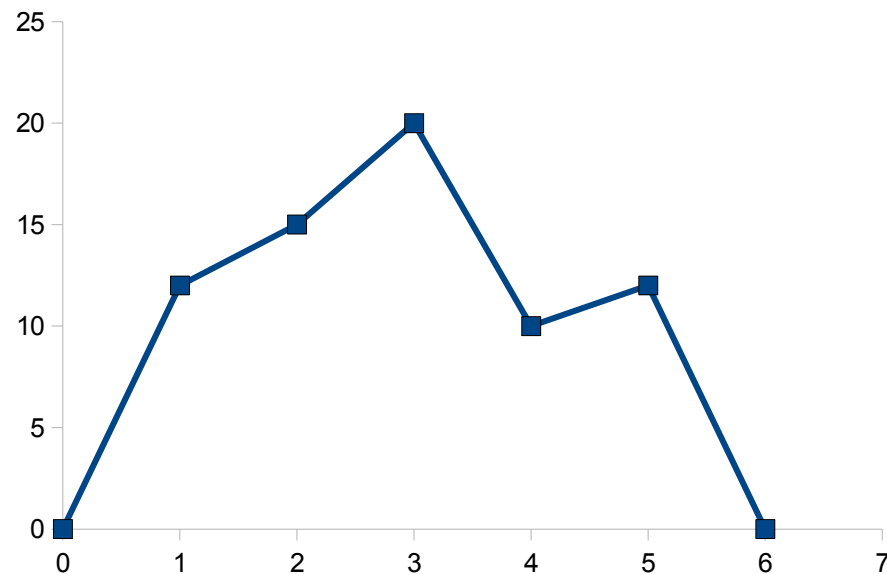
# Histograms (2)

$X$	$f$
5	12
4	10
3	20
2	15
1	12

$X$	$f$
40-44	4
35-39	8
30-34	10
25-29	20
20-24	15
15-19	13

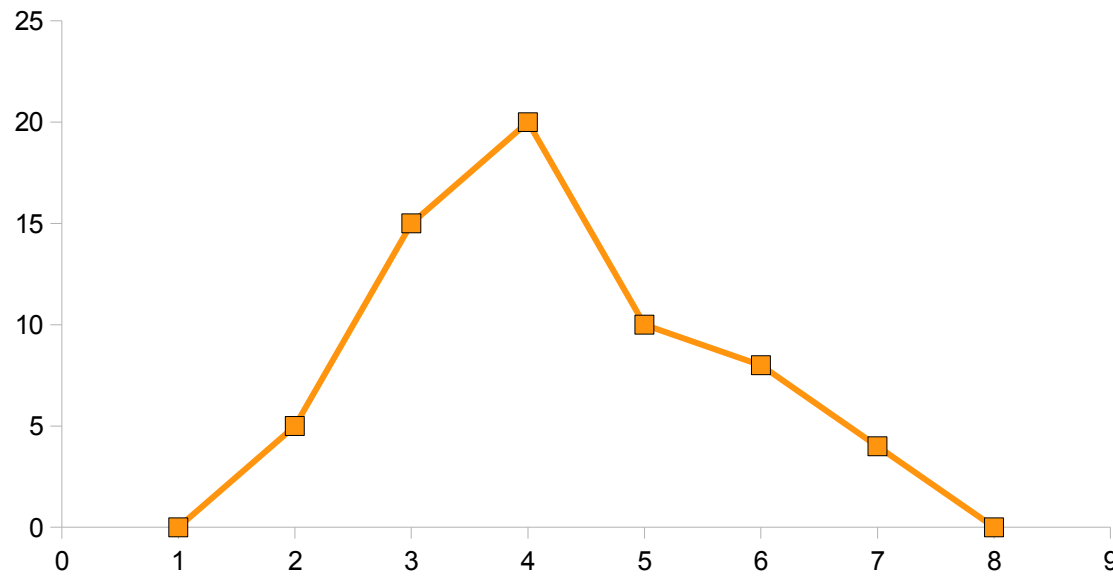


# Polygons





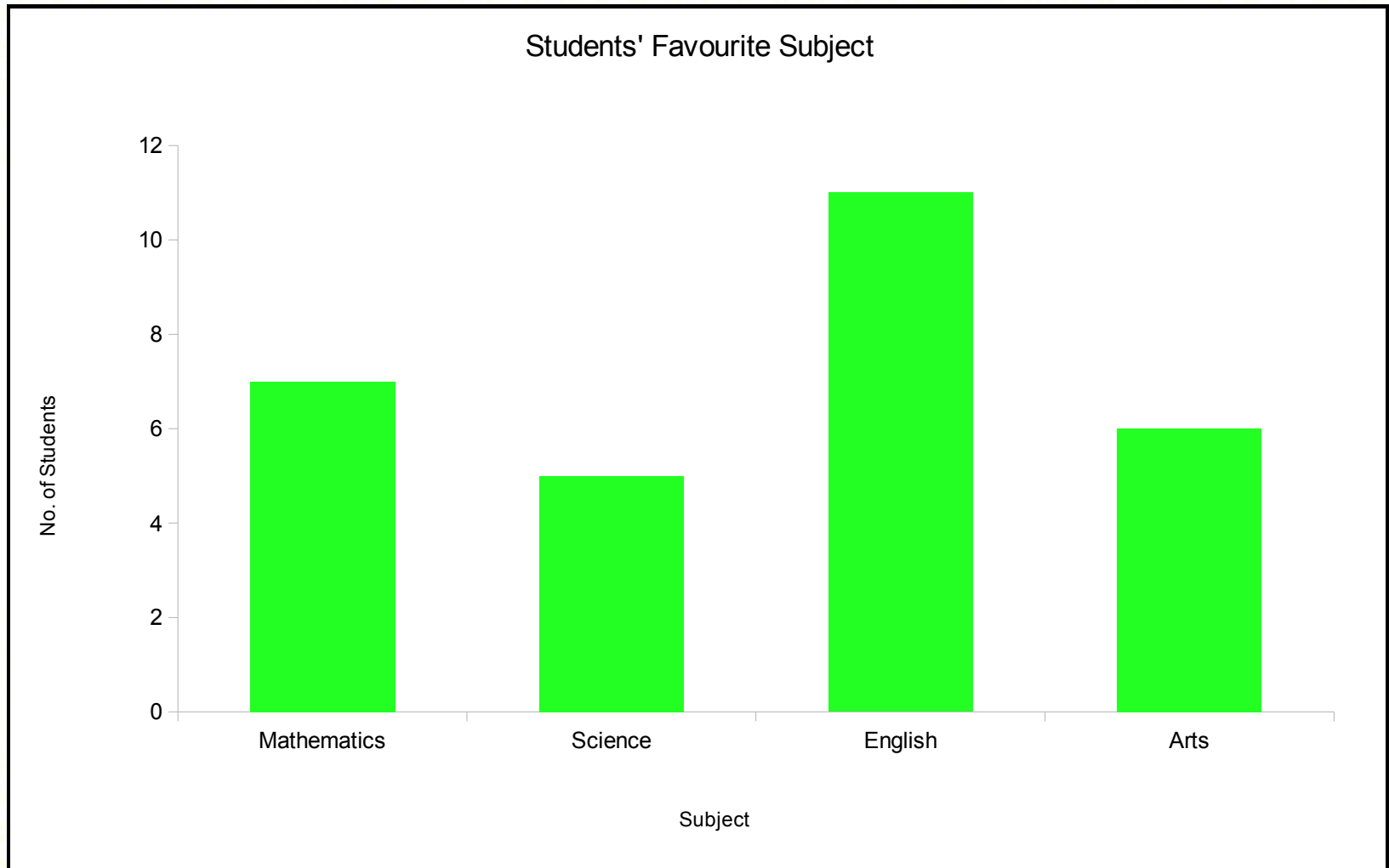
# Polygons (2)



# Bar graphs

When the scores are measured nominal or an ordinal scale, the bar graph is used to represent frequency distribution.

# Bar graphs (2)

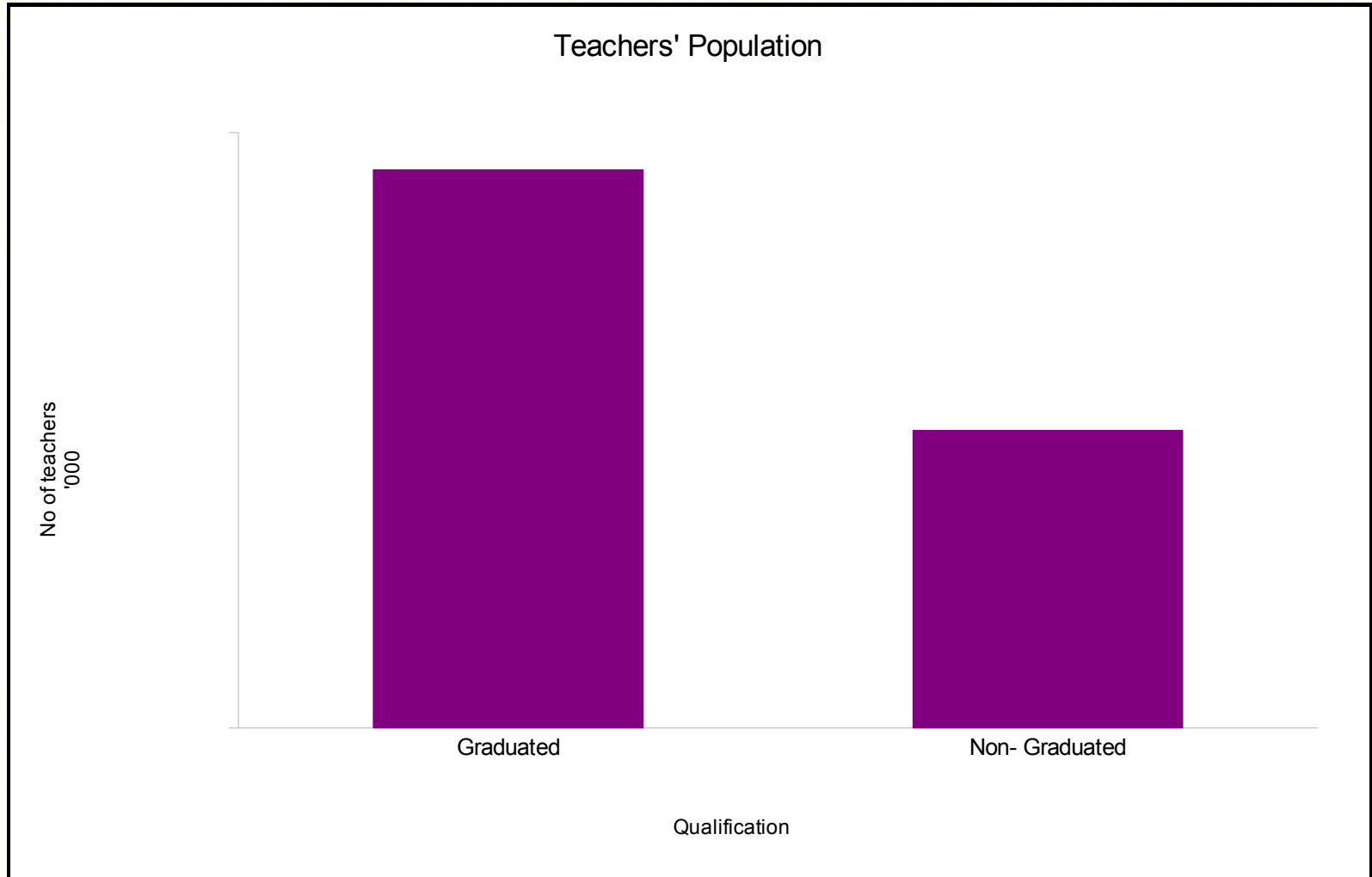


# Relative frequency

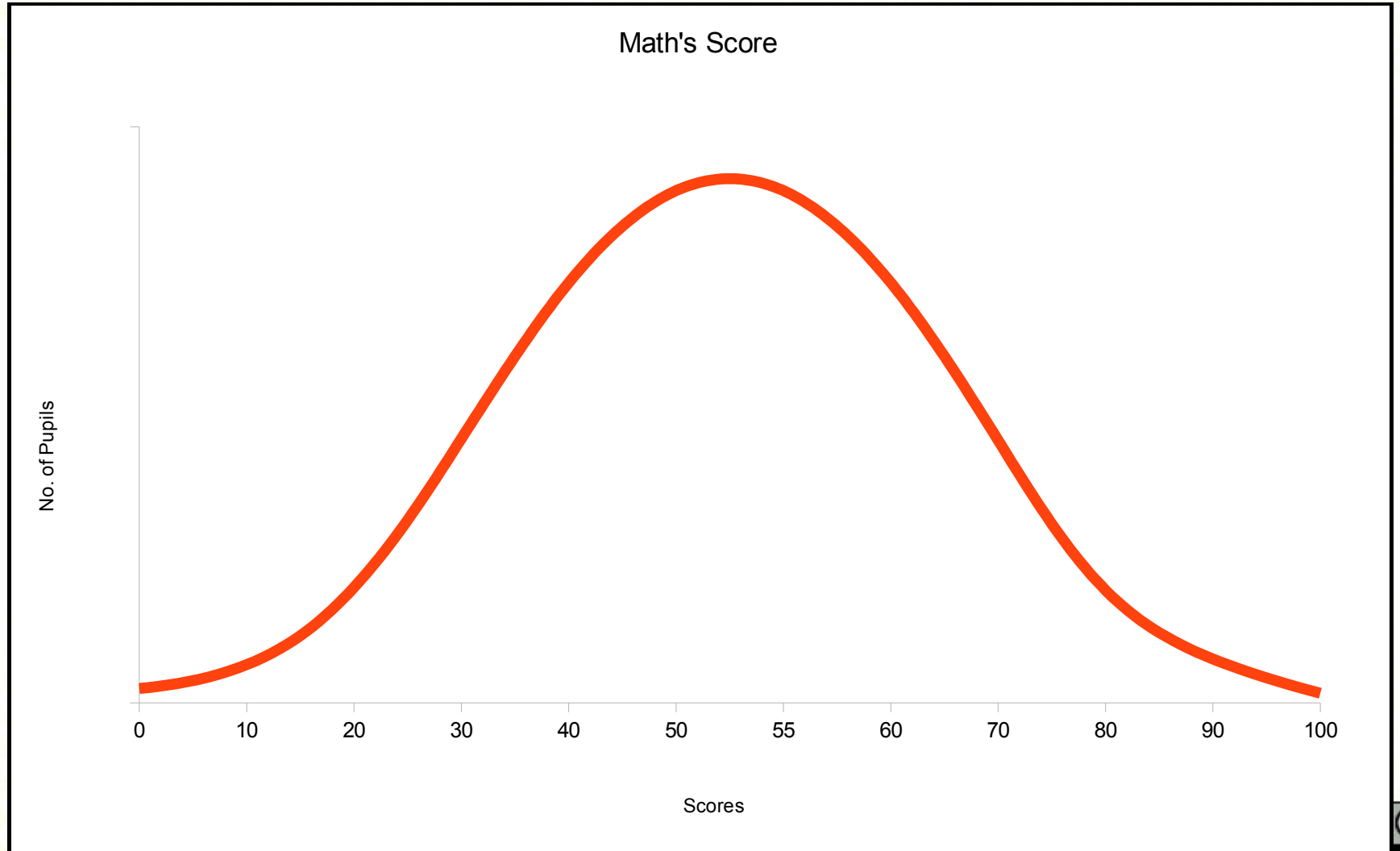
- Relatif frequency is appropriate to display frequency distribution for large population.
-



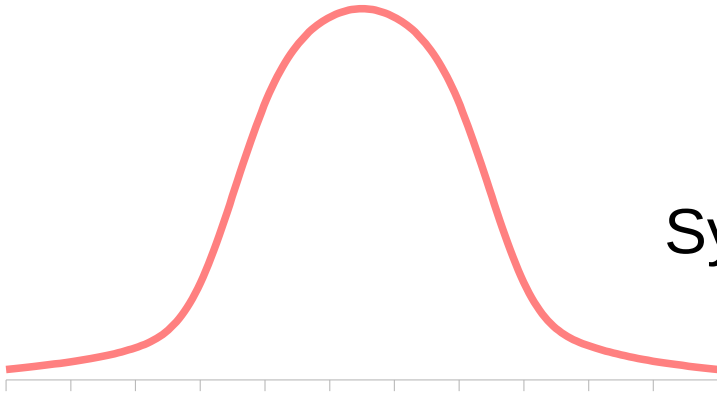
# Relative frequency (2)



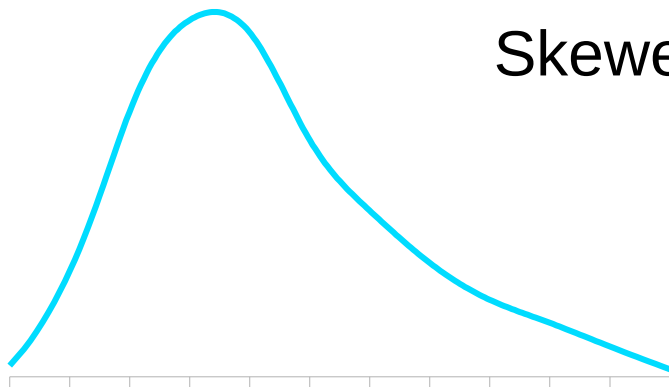
# Smooth curve



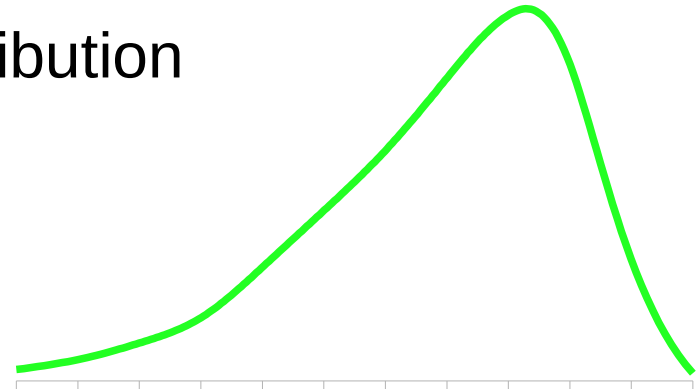
# Smooth curve



Symmetrical Distribution



Skewed Distribution



# Percentiles and Percentile Ranks, and Interpolation

- The relative location of score can be identified by percentiles and percentile ranks.
- The percentile rank for a score is the percentage of individual with scores equal to or less than the score.
- The particular score is referred as a percentile.



# Percentiles and Percentile Ranks, and Interpolation

Class	Frequency	Cumulative Frequency	Cumulative %
Arif	45	45	22.5%
Bestari	40	85	42.5%
Cemerlang	38	123	61.5%
Dinamik	40	163	81.5%
Elit	37	200	100%

What is the 80<sup>th</sup> percentile?

# Percentiles and Percentile Ranks, and Interpolation (2)

# Percentiles and Percentile Ranks, and Interpolation