

## Section 2.1 - Frequency Distributions and Their Graphs

1. Definitions: (Use Example #1 for all parts.)

- (a) **Frequency distribution:** a table that shows **classes** or **intervals** of data entries with a count of the number of entries in each class.
- (b) **Frequency** (of a class): the number of data entries in a class.
- (c) **Lower/upper class limit**
- (d) **Class width:** distance between lower (or upper) limits of consecutive classes
- (e) **Range:** difference between maximum and minimum entries
- (f) **Midpoint** (of a class): (class mark) the average of the lower and upper class limits.
- (g) **Relative frequency** (of a class): the proportion or percentage of data that falls into the class

$$\text{Relative frequency} = \frac{\text{Class frequency}}{\text{Sample Size}}.$$

- (h) **Cumulative frequency** (of a class): the sum of the frequency for that class and all previous classes. The cumulative frequency of the last class is equal to the sample size ( $n$ ).

2. Graphs of Frequency Distributions

- (a) **Frequency distribution:** a bargraph that represents the frequency distribution of a data set.
  - The horizontal scale is quantitative and measures data values.
  - The vertical scale measures the frequencies of the classes.
  - Consecutive bars must touch.
- (b) **Frequency polygon:** a line graph that emphasizes the continuous change in frequencies.
- (c) **Cumulative frequency graph/ogive** (o-jive): a line graph that displays the cumulative frequency of each class at its upper class boundary.

3. Example #1: ATM Withdrawals.

Construct a frequency distribution, histogram, and frequency polygon using seven data classes.

35	10	30	25	75	10	30	20	20	10	40
50	40	30	60	70	25	40	10	60	20	80
40	25	20	10	20	25	30	50	80	20	

4. Example #2: Exam scores for all students in a statistics class.

Construct a frequency distribution, relative frequencies and cumulative frequencies with five data classes.

83	92	94	82	73	98	78	85	72	90
89	92	96	89	75	85	63	47	75	82