Math 11 Foundations
Statistics Summary

mean = average = $\frac{5+3+4}{3} = 4$

median = middle = $\not{3}, 4, \not{5} = 4$

mode = most common = $\underline{3}, 5, \underline{3}, 7, 8 = 3$

range = highest # − lowest # = $8 - 3 = 5$

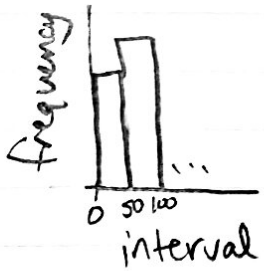
intervals = allows us to lump data into sections

$$= \frac{\text{range}}{\text{\# of intervals you want}}$$

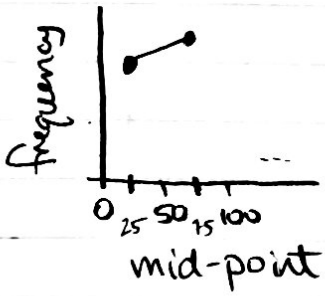
frequency distribution table

mid-pt	interval	frequency
25	0-50	5
75	51-100	7 ← there are 7 data points that fall in the 50-100 interval
⋮	⋮	⋮

Histogram



Frequency Polygon



connect the dots (not best fit line)

standard deviation

$$\sigma = \sqrt{\frac{\Sigma(x-\bar{x})^2}{n}} \quad \text{or} \quad \sigma = \sqrt{\frac{\Sigma f(x-\bar{x})^2}{n}}$$

x = data value or mid-point in case of interval

$$\underset{(\text{avg})}{\bar{x}} = \frac{x_1 + x_2 + x_3 + \cdots}{n} \quad \text{or} \quad \bar{x} = \frac{f_1 x_1 + f_2 x_2 + \cdots}{n}$$

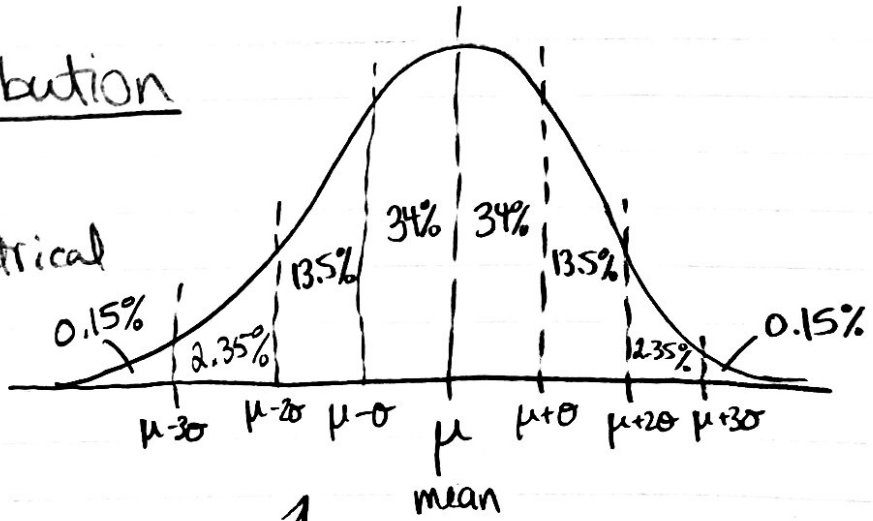
n = the # of data points or intervals, or
= add up all values of f

f = the # of times each individual data point occurs.

the smaller σ, the more consistent the data
- more of data closer to mean, less scattered

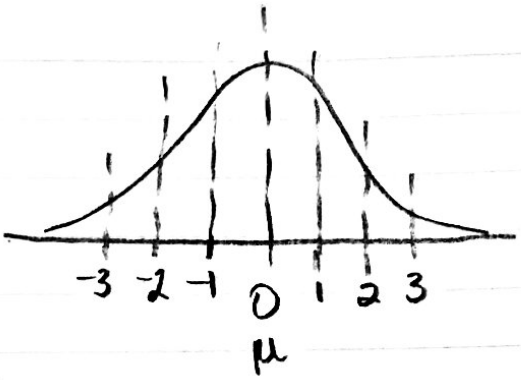
normal distribution

- graph is symmetrical
- mean, median and mode are equal (or close)



- calculate values for specific problems.
- sometimes need values btwn these, then use z-scores

Z-scores



- same normal distribution, just # x-axis differently
- use chart to convert percentages ↔ z-scores

$$z = \frac{x - \mu}{\sigma}$$

Confidence Intervals

A sample of (1000) [sample size] is accurate within (±3.1%) [margin of error] (19 times out of 20) [confidence level]

$1000 + 3.1\%$ to $1000 - 3.1\%$

$1000 + 31$ to $1000 - 31$

(1031 to 969) [confidence interval]

- larger sample size means likely more accurate so the margin of error decreases.
- larger sample size (with same confidence level) means the range of the confidence interval decreases.
- for constant margin of error, if confidence level increases then sample size must be larger too.