MATH 201 Exam 1 Topics

Terminology – Statistics, Population vs. Sample, Parameter vs. Statistic, Qualitative Variables - ordinal, nominal, Quantitative Variables - discrete, continuous

Graphical Summaries of Data:
Bar Graphs – side-by-side bar graphs
Pie Charts
Histograms – classes, tallies, class width, frequency, relative frequency, skewness, symmetric

Numerical Summaries of Data
Measures of Center: Mean (μ and $\bar{x}$), Median, Mode.

Measures of Spread:

Range = Max. – Min.
Variance – Population vs. Sample σ^2 and s^2
Standard Deviation – Population vs. Sample σ and s

Standard Deviation Formula	
Population	**Sample**
$\sigma = \sqrt{\frac{\sum(X-\mu)^2}{N}}$	$s = \sqrt{\frac{\sum(X-\bar{x})^2}{n-1}}$
X – The Value in the data distribution *μ – The population Mean* *N – Total Number of Observations*	*X – The Value in the data distribution* *$\bar{x}$ – The Sample Mean* *n - Total Number of Observations*

Empirical Rule – bell-shaped data 68% - 95% - 99.7%

Co-efficient of variation $\frac{s.d.}{mean} * 100\%$ to compare variability and/or consistency of data sets

Measures of Position:

z-Scores = $\frac{X-mean}{s.d.}$ to compare distance from the mean in standard units

Percentiles and Quartiles – 1st, 2nd, 3rd P_x Q_x
Percentiles: a.) %-ile of a number x: $p = \frac{(\text{number of values below x}) + .5}{n} \cdot 100$ (n is the total number of values), round to nearest whole number

b.) Data value for p^{th} percentile: $L = \frac{n \cdot p}{100}$

If L is a whole number, then average the values in position L and position (L + 1)

If L is not a whole number, round it up to the next higher number

Five Number Summary

Outliers
Interquartile Range (IQR = $Q_3 - Q_1$)
IQR method to find outliers: $Q_3 + 1.5$ (IQR) and $Q_1 - 1.5$ (IQR)

Boxplots/Box-and-Whisker plots – creation and interpretation.