

# RATIOS/RATES/PROPORTIONS PROBABILITY & STATISTICS

## FRACTION-DECIMAL-PERCENTS

$$\frac{A}{B} = B \overline{)A.00} = xx.00\%$$

**To convert a fraction into a decimal:** divide the denominator (bottom number) into the top number (numerator). (Usually need to add a decimal point and a couple of 0's afterward).

**To convert a decimal into a percent:** Move the decimal two places to the right. Add the % sign.

**To convert a percent into a decimal:** Move the decimal two places to the left.

### To convert a decimal into a fraction:

The number to the left of the decimal is the whole number.  
 The number to the right is the numerator (# on top of fraction)  
 The place value of the last digit on the right is the denominator.  
 Reduce

Example:  $4.23 = 4 \frac{23}{100}$        $\frac{0.\_}{10^{\text{ths}}}$      $\frac{0.\_}{100^{\text{ths}}}$      $\frac{0.\_}{1000^{\text{ths}}}$      $\frac{0.\_}{10,000^{\text{ths}}}$      $\frac{0.\_}{100,000^{\text{ths}}}$

**To convert a percent into a fraction:** Put the percent number over 100 and reduce.

## RATIOS & PROPORTIONS

**Ratio:** Comparison of two values.

Can be expressed in one of four ways: A to B, A:B, A out of B,  $\frac{A}{B}$

**Rate:** A ratio with two different units of measurement.  
 25 people : 4 cars

**Unit Rate:** A Rate with a denominator of "1". Uses the word "per" to express the 1.  
 25 miles per hour.

**Proportion:** A comparison of two ratios.

$$\frac{A}{B} = \frac{C}{D}, \text{ where } AD = BC$$

## PERCENTS

### Calculating Percents:

Two methods: Fill in the blanks to the sentence, translate to math equation, then solve.

\_\_\_\_\_ % of the (whole) is (part)  
 (change % to a decimal)                      "of" → ×                      "is" → "="

Or:  $\frac{\%}{100} = \frac{\text{part}}{\text{whole}}$

### Percent of Increase/Decrease:

$$\frac{\% \text{ of change}}{100} = \frac{\text{amount of change}}{\text{original amount}}; \text{ solve as a proportion.}$$

# RATIOS/RATES/PROPORTIONS

## PROBABILITY & STATISTICS

### PROBABILITY

$$\frac{\text{\# of favorable outcomes}}{\text{\# of possible outcomes}}$$

### ODDS

$$\frac{\text{\# of favorable outcomes}}{\text{\# of unfavorable outcomes}}$$

### STATISTICS

**Mean:**  $\frac{\text{Sum of all the data}}{\text{\# of data}}$ ; also known as the “average”

**Median:** When all of the values are ordered from least to greatest, the middle value. If there is an even number of data values, it is the average of the middle two values.

**Mode:** The most common value; if all values appear only once, there is no mode. If more than one data value appears most often, then list each of them.

**Sample Size:** The number of data values

**Range:** difference from the highest value to the lowest value

**Lower Quartile (Q<sub>1</sub>):** Median value of the lower half of data values

**Upper Quartile (Q<sub>3</sub>):** Median value of the upper half of data values

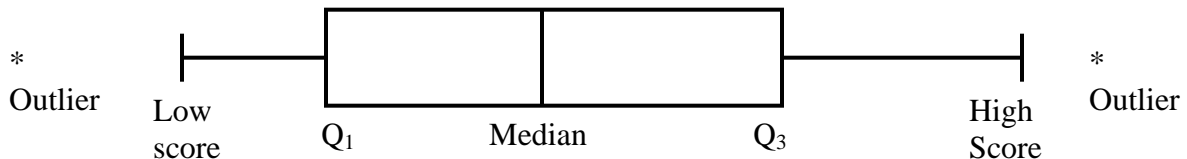
**Interquartile Range (IQR):** Difference between the Lower Quartile and Upper Quartile values [Q<sub>1</sub> – Q<sub>3</sub>]

**Outlier Value:** 1.5 × Interquartile Range (IQR)

**Outlier Limits:** Q<sub>1</sub> – Outlier Value; Q<sub>3</sub> + Outlier Value

**Outliers:** Any data value outside of the Outlier Limits

### Box-Whisker Plot:



**Circle Graphs:** To determine the measure of the central angle of the circle for each piece of data, multiply the % representing the data (change it to a decimal first) × 360.