

PROBABILITY

Type	Notation & Things to Remember	Formula
AN EVENT	<ul style="list-style-type: none"> • $P(E) \rightarrow$ Probability of an event • $S \rightarrow$ Sample space <ul style="list-style-type: none"> ○ Usually the <i>grand total</i> or all data 	$P(E) = \frac{n(E)}{n(S)} = \frac{\text{the \# of outcomes in the event/chance of an event}}{\text{the sample space}}$
INTERSECTION	<ul style="list-style-type: none"> • <i>and</i> • The overlap • $P(A \cap B)$ 	$\frac{\text{overlap of } A \& B}{\text{total}}$
UNION	<ul style="list-style-type: none"> • <i>or</i> • $P(A \cup B)$ 	$\frac{A + B - \text{overlap of } A \& B}{\text{total}}$
COMPLEMENT	<ul style="list-style-type: none"> • <i>NOT</i> something <ul style="list-style-type: none"> ○ The chance of an event <i>not</i> occurring 	$1 - P(E)$
MUTUALLY EXCLUSIVE	<ul style="list-style-type: none"> • Events that cannot happen at the same time 	$P(A \cap B) = 0$
INDEPENDENT	<ul style="list-style-type: none"> • The outcome of one event does not change the probability of the other event 	$P(A \cap B) = P(A) \cdot P(B)$ <p style="text-align: center;"><i>or</i></p> $P(A \text{ and } B) = P(A) \cdot P(B)$
CONDITIONAL	<ul style="list-style-type: none"> • An event occurring after a given event has already happened • $P(A B)$ <ul style="list-style-type: none"> ○ "<i>probability of A given B</i>" 	$P(A B) = \frac{P(A \cap B)}{P(B)}$