Vocabulary, Set Notation, and Venn Diagrams

Probability

- A number from 0 to 1
- As a percent from 0% to 100%
- Indicates how likely an event will occur

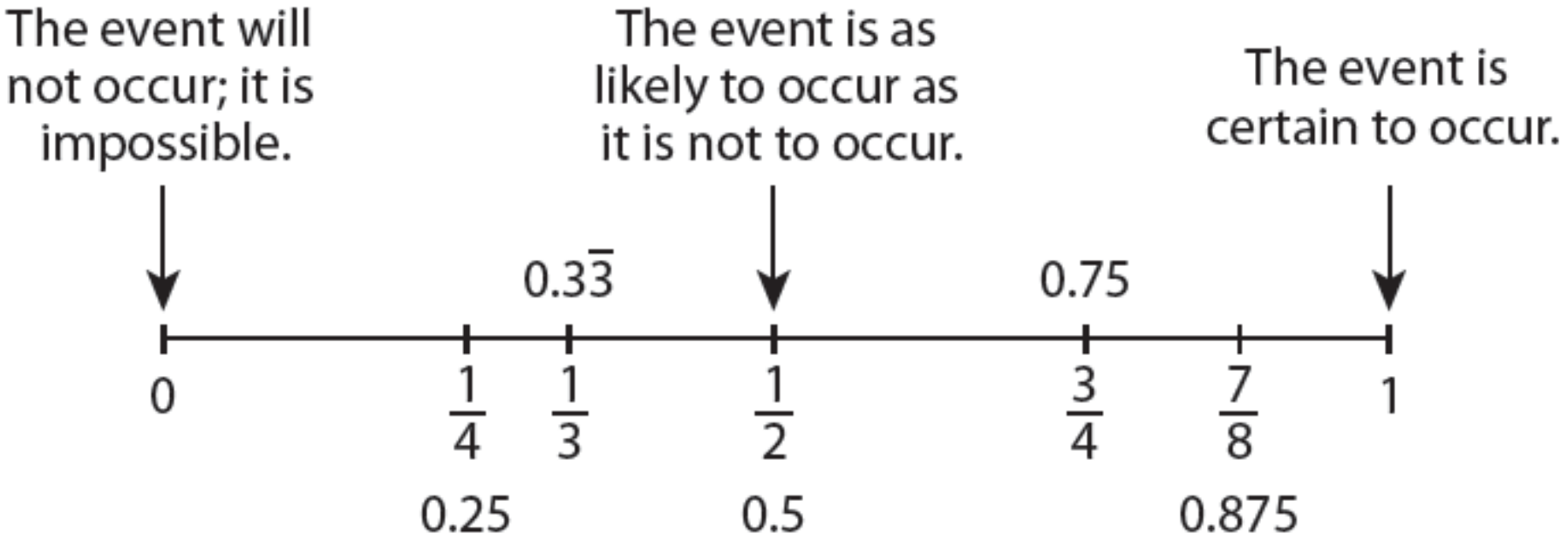


Diagram from Walch Education

Experiment

- Any process or action that has observable results.

- *Example: drawing a card from a deck of cards is an experiment*

Outcomes

- Results from experiments

- *Example: all the cards in the deck are possible outcomes*

Sample Space

- The set (or list) of all possible outcomes.
- Also known as the universal set
- *Example: listing out all outcomes when rolling two dice*

Event

- A subset of an experiment
- An outcome or set of desired outcomes

- *Example: drawing a single Jack of hearts*

Set

- List or collection of items

Ex: Roll a die: {1, 2, 3, 4, 5, 6}

Subset

Even #s: Die {2, 4, 6}

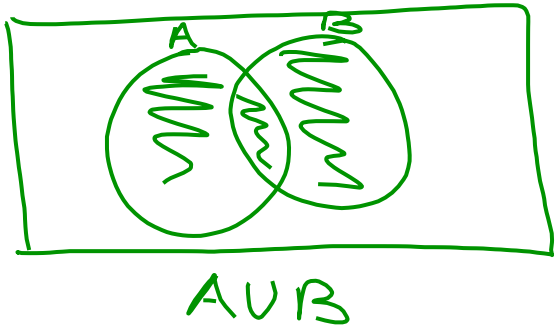
- List or collection of items all contained within another set
- Denoted by $A \subset B$, if all the elements of A are also in B.

Empty Set

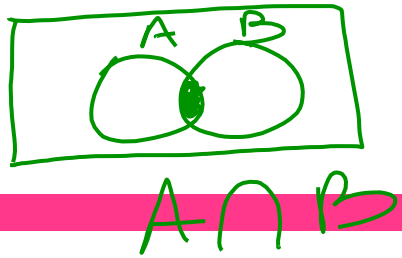
- A set that has NO elements
- Also called a **null set**.
- Denoted by ∅

Union

- Denoted by $\cup$
- To unite
- Everything in **both** sets



Intersection



- Denoted by ∩
- Only what the sets **share** in common

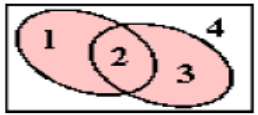
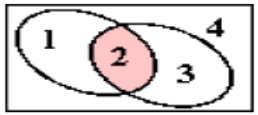
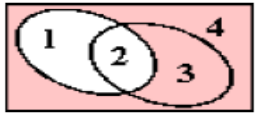
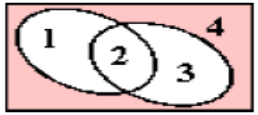
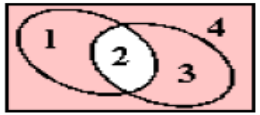
Complement – 'NOT' the set

- Denoted 2 different ways

$$A' \text{ or } \overline{A}$$

- Everything OUTSIDE of this set

Set Notation Handout

Set Notation	Pronunciation	Meaning	Venn Diagram
$A \cup B$	"A union B"	Everything in both sets	
$A \cap B$	"A intersect B"	Only what is in common with both sets	
$\overline{A}$ or A'	"A complement"	Everything NOT in set A	
$(A \cup B)'$	"not A union B"	Everything NOT in set A and set B	
$(A \cap B)'$	" not A intersect B"	Everything NOT in common between set A and set B	

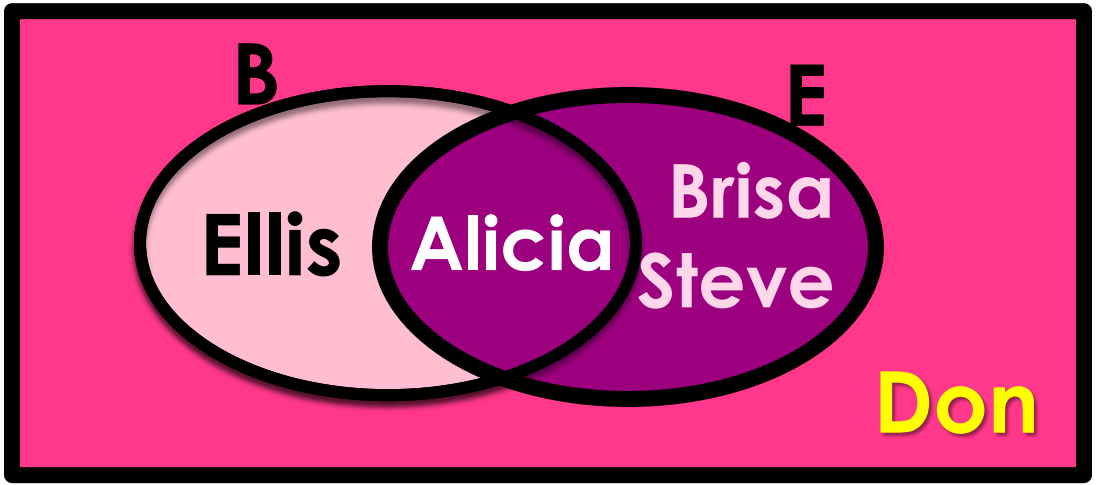
Answer

Hector has entered the following names in the contact list of his new cellphone: Alicia, Brisa, Steve, Don, and Ellis.

B: The name begins with a vowel.

E: The name ends with a vowel.

1. Draw a venn diagram to represent this.



Hector has entered the following names in the contact list of his new cellphone: Alicia, Brisa, Steve, Don, and Ellis.

B: The name begins with a vowel.

E: The name ends with a vowel.

2. List the outcomes of B.

$B = \{Ellis, Alicia\}$

Hector has entered the following names in the contact list of his new cellphone: Alicia, Brisa, Steve, Don, and Ellis.

B: The name begins with a vowel.

E: The name ends with a vowel.

3. List the outcomes of E.

$E = \{Alicia, Brisa, Steve\}$

Hector has entered the following names in the contact list of his new cellphone: Alicia, Brisa, Steve, Don, and Ellis.

B: The name begins with a vowel.

E: The name ends with a vowel.

4. List the outcomes of B∩E.

$$B \cap E = \{Alicia\}$$

Hector has entered the following names in the contact list of his new cellphone: Alicia, Brisa, Steve, Don, and Ellis.

B: The name begins with a vowel.

E: The name ends with a vowel.

5. List the outcomes of B∪E.

$B \cup E = \{Ellis, Alicia, Brisa, Steve\}$

Hector has entered the following names in the contact list of his new cellphone: Alicia, Brisa, Steve, Don, and Ellis.

B: The name begins with a vowel.

E: The name ends with a vowel.

6. List the outcomes of B'.

B'= {Brisa, Steve, Don}

Hector has entered the following names in the contact list of his new cellphone: Alicia, Brisa, Steve, Don, and Ellis.

B: The name begins with a vowel.

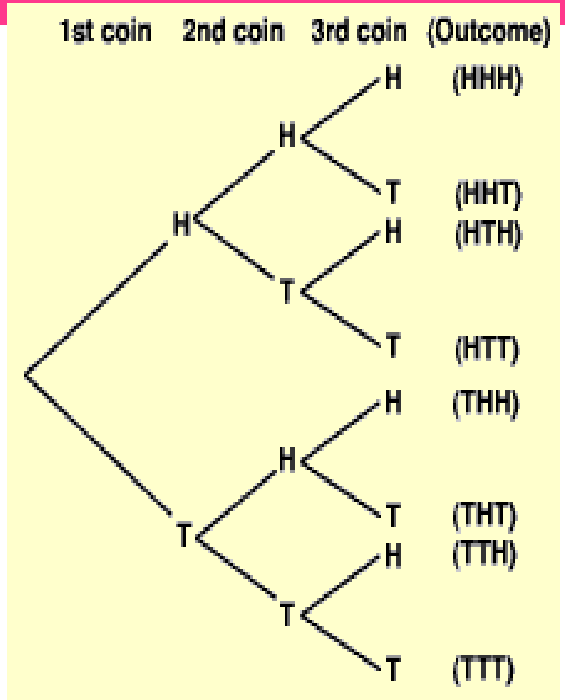
E: The name ends with a vowel.

7. List the outcomes of $(B \cup E)'$.

$$(B \cup E)' = \{Don\}$$

Tree Diagrams

- Tree diagrams allow us to see all possible outcomes of an event and calculate their probabilities.
- This tree diagram shows the probabilities of results of flipping three coins.



Multiplication Counting Principle
(aka Fundamental Counting Principle)

- At a sporting goods store, skateboards are available in 8 different deck designs. Each deck design is available with 4 different wheel assemblies. How many skateboard choices does the store offer?

Multiplication Counting Principle

- A father takes his son Tanner to Wendy's for lunch. He tells Tanner he can get the 5 piece nuggets, a spicy chicken sandwich, or a single for the main entrée. For sides: he can get fries, a side salad, potato, or chili. And for drinks: he can get milk, coke, sprite, or the orange drink. How many options for meals does Tanner have?