

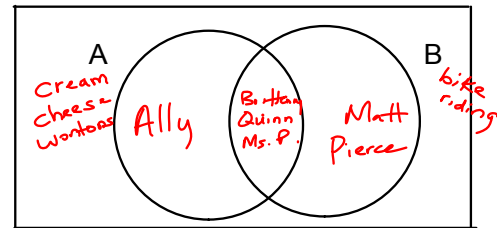
Learning Targets

- I can determine the sample space for a given event or series of events.
- I can draw and correctly label a Venn Diagram.
- I understand union and intersection and how to find each one.

Aug 31-1:51 PM

Venn Diagram

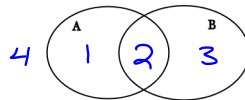
A group (set) of 2 or more circles that shows how sets are related.



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$S = \{1, 2, 3, 4\}$
 $A = \{1, 2\}$
 $B = \{2, 3\}$

Venn Diagram:



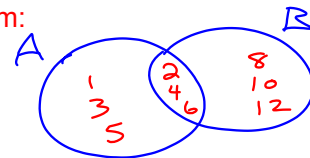
| Set Notation | Pronunciation | Meaning | Venn Diagram | Answer |
|--|---|--|--------------|---------------|
| $A \cup B$ | "A union B" | A or B, everything that is in either of the sets | | $\{1, 2, 3\}$ |
| $A \cap B$ | "A intersect B" | Only the things that are in both of the sets | | $\{2\}$ |
| A^c or $\sim A$ | "A complement" or "not A" | Everything not in set A | | $\{3, 4\}$ |
| $(A \cup B)^c$ or $\sim(A \cup B)$ | "[A union B] complement" or "not [A union B]" | Everything outside both A and B | | $\{4\}$ |
| $(A \cap B)^c$ or $\sim(A \cap B)$ | "[A intersect B] complement" or "not [A intersect B]" | Everything outside the overlap of A and B | | $\{1, 2, 3\}$ |

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Example 1:

Two Sets: $A = \{1, 2, 3, 4, 5, 6\}$
 $B = \{2, 4, 6, 8, 10, 12\}$

Venn Diagram:



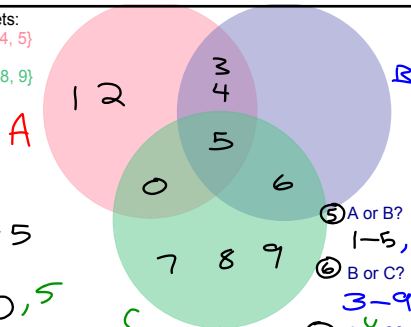
Intersection--what sets have in common (the overlap) ("and") $A \cap B = \{2, 4, 6\}$

Union--items that are in both sets all together (including the overlap) ("or") $A \cup B = \{1, 2, 3, 4, 5, 6, 8, 10, 12\}$

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Example 2: Sets:

$A = \{0, 1, 2, 3, 4, 5\}$
 $B = \{3, 4, 5, 6\}$
 $C = \{0, 5, 6, 7, 8, 9\}$



- 1 A and B? $3, 4, 5$
- 2 B and C? $6, 5$
- 3 A and C? $0, 5$
- 4 A and B and C? 5
- 5 A or B? $1-5, 6, 0$
- 6 B or C? $3-9, 0$
- 7 A or C? $0-9$
- 8 A or B or C? $0-9$

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Example 3:

people who have cell phone: 29

people who have iPad: 9

people who have both: 9

Draw a Venn Diagram



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Equal Sets-sets that have the exact same elements
 $A = \{1, 2\}$ and $B = \{1, 2\}$

Joint Sets-sets that have at least one element in common
 $C = \{\text{blue, red, yellow}\}$
 $D = \{\text{yellow, green, purple}\}$

Disjoint Sets (mutually exclusive)-sets that have no elements in common
 $F = \{\text{heads, tails}\}$
 $G = \{1, 2, 3, 4, 5, 6\}$

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Sample Space - set of all possible outcomes
Event - a set of outcomes that meet our requirements
Outcome - a result

Examples:
 Roll a die once
 sample space is $\{1, 2, 3, 4, 5, 6\}$
 event is getting an odd number $\{1, 3, 5\}$
 outcome is getting a 1

Flip a coin twice
 sample space is $\{HT, TH, HH, TT\}$
 event is getting $\{HH\}$
 outcome is getting a HT

Pick one vowel
 sample space is $\{a, e, i, o, u\}$
 event is picking an "i"
 outcome is getting an "e"

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Sample Space

Example 4:

Rolling a dice:
 $S = 1, 2, 3, 4, 5, 6$

Flipping two coins:
 $S = \begin{matrix} HH \\ HT \\ TH \\ TT \end{matrix}$

The word MISSISSIPPI:
 $S = \begin{matrix} M \\ I \\ S \\ S \\ P \end{matrix}$

Possible sums when rolling 2 dice:
 $S = \begin{matrix} 2, 3, 4, 5, \\ 6, 7, 8, 9, 10, 11, \\ 12 \end{matrix}$

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Assignment:

Section 1.1 Worksheet

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