

$A = \{1, 3, 7, 8\}$ Which are true/false?

$1 \in A$ $\{1\} \in A$ $2 \in A$

$\{1, 3\} \subseteq A$ $\{1, 2\} \subseteq A$

$\emptyset \in A$ $\emptyset \subseteq A$ $\{\emptyset\} \subseteq A$

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$A = \{1, 3, 7, 8\}$ Which are true/false?

$1 \in A$ $\{1\} \in A$ $2 \in A$

True False False
subset, not element no 2 in A

$\{1, 3\} \subseteq A$ $\{1, 2\} \subseteq A$
True False
no 2 in A

$\emptyset \in A$ $\emptyset \subseteq A$ $\{\emptyset\} \subseteq A$
False True False
not in the set not a subset

$n(A)$ = number of elements in set A

Two sets A and B are equivalent if $n(A) = n(B)$

Which sets are equivalent?

$A = \{1, 5, 6, 8\}$ $B = \{\text{Alpha}, \text{Beta}\}$
 $C = \{X, Y, Z\}$ $D = \{x: x \text{ is a letter in Mississippi}\}$
 $E = \{1, A, \emptyset\}$ $F = \{3, 6, 9, \dots, 27\}$
 $G = \{x: x \text{ is a whole number, } 0 < x < 10\}$

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$n(A)$ = number of elements in set A

Two sets A and B are equivalent if $n(A) = n(B)$

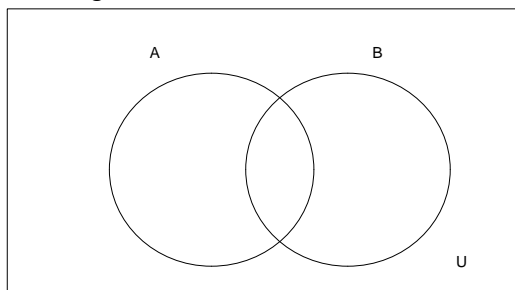
Which sets are equivalent?

$A = \{1, 5, 6, 8\}$ $B = \{\text{Alpha}, \text{Beta}\}$
 $n(A) = 4$ $n(B) = 2$
 $C = \{X, Y, Z\}$ $D = \{x: x \text{ is a letter in Mississippi}\}$
 $n(C) = 3$ $n(D) = 4$
 $E = \{1, A, \emptyset\}$ $F = \{3, 6, 9, \dots, 27\}$
 $n(E) = 3$ $n(F) = 9$
 $G = \{x: x \text{ is a whole number, } 0 < x < 10\}$
 $n(G) = 9$ C&E, D&G

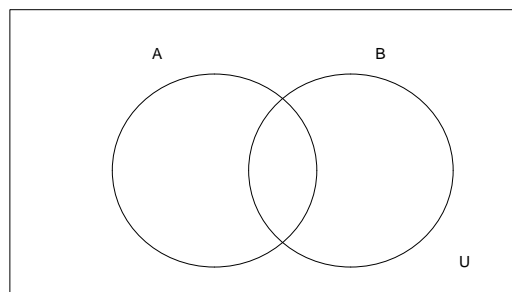
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Venn Diagrams and Proper Subsets

- A **Venn diagram** is used to visualize relationships among sets.

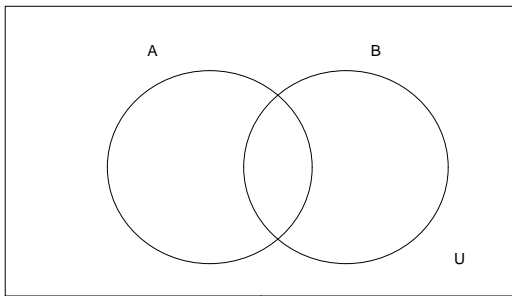


$U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
 $A = \{1, 2, 4, 5, 7, 8, 10\}$
 $B = \{2, 4, 6, 8, 10\}$



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$U = \{ 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 \}$
 $A = \{ 3, 4, 5, 6, 7 \}$
 $B = \{ 1, 3, 4, 6, 8, 9 \}$



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List all proper subsets of $\{a, b, c\}$

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List all proper subsets of $\{a, b, c\}$

$\{a, b, c\}$

$\{a, b\}$ $\{a, c\}$ $\{b, c\}$

$\{a\}$ $\{b\}$ $\{c\}$

$\{\}$

There are $2^3 = 8$ of them.

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