

Set- collection of objects, not necessarily a mathematical one.

(Order in which the set is written does not matter

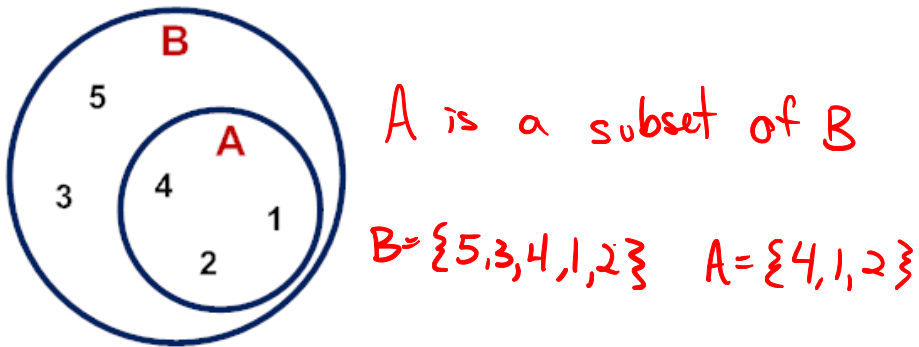
each element is only counted once) { }

Ex. 1 
 {  }

Ex. 2 1,1,1,4,4,4,4,4,4,5,5,5,5,6,6,6,6,7,7,7,12

{ 1, 4, 5, 6, 7, 12 } Even { 4, 6, 12 }
 ODD { 1, 5, 7 }

A subset is a portion of a set

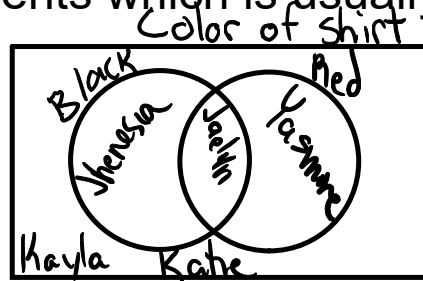


Ex.1 Is set T a subset of set S? Explain your answer

T = {~~8~~, ~~10~~, ~~9~~, 13, 16, 14, 4} S = {4, 15, 16, ~~8~~, ~~10~~, ~~9~~, 14, 27}

No, not all elements in T are in set S.

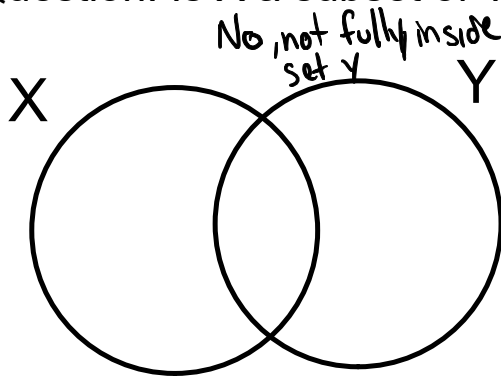
The Universal set, or parent set, is the set of all possible elements which is usually denoted by the letter U.



*The box represents the universal set

Any ideas for a possible Universal Set?

Question: Is X a subset of Y? Is X a universal set?



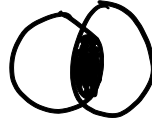
No, does not include all elements.

Operations of sets

X = { red, green, blue, Teal } and Y = { white, black, green, pink }

Intersection: The set created from all the elements that both sets have in common. This is notated with the symbol \cap and is usually thought of as meaning "and"

what have in common
 $X \cap Y = \{ \text{green} \}$



Union: The set created from all the elements contained in either or both sets. This is notated with the symbol \cup and is usually thought of as meaning "or".

put together

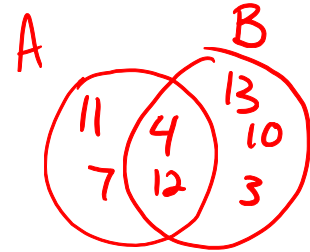
$X \cup Y = \{ \text{red, green, blue, teal, white, black, pink} \}$

\cup - Union

\cap - intersection

Example 2

$A = \{11, 4, 12, 7\}$ $B = \{13, 4, 12, 10, 3\}$
Find the intersection and union



$$A \cap B = \{4, 12\}$$

$$A \cup B = \{11, 4, 12, 7, 13, 10, 3\}$$

Can you complete number 1?

hint YOU CAN!

1. Let A, B and C be three sets such that:

Set A = {2, 4, 6, 8, 10, 12}, set B = {3, 6, 9, 12, 15}, and set C = {1, 4, 7, 10, 13, 16}.

Find:

(i) $A \cup B$ $\{2, 4, 6, 8, 10, 12, 3, 9, 15\}$

(ii) $A \cap B$ $\{12, 6\}$

(iii) $B \cap A$ $\{12, 6\}$

(iv) $B \cup A$ $\{2, 4, 6, 8, 10, 12, 3, 9, 15\}$

(v) $B \cup C$

$\{3, 6, 9, 12, 15, 1, 4, 7, 10, 13, 16\}$

(vi) Is $A \cup B = B \cup A$?

Yes

(vii) Is $B \cap C = B \cup C$?

NO

(viii) $(A \cup B) \cap (A \cap B)$ $\{12, 6\}$

Disjoint sets are sets that have no elements in common.



Empty set is the set with no elements. $\{ \}$

Ex. $X = \{2, 5, 23, 4\}$ and $Y = \{7, 8, 9\}$ Null set

a. Are these sets disjoint?

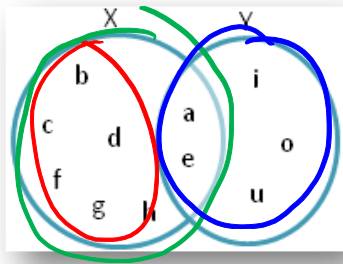
Yes, no elements in common

b. Find the union and intersection of the sets.

$$X \cup Y = \{2, 5, 23, 4, 7, 8, 9\}$$

$$X \cap Y = \{ \}$$

Compliment of a set- is the elements that are not in the indicated set. Notation X^c , X^{\complement} , and \overline{X}
what is not in X.



$$\overline{X} = \{i, o, u\}$$

$$Y^c = \{b, c, d, f, g, h\}$$

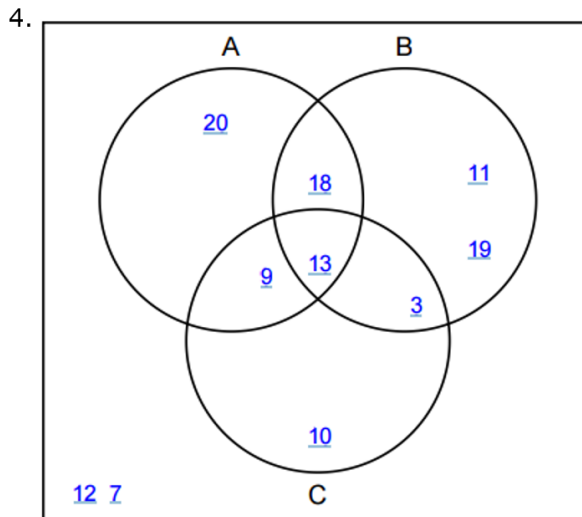
$$X^c \cap Y^c = \{ \}$$

$$Y^c \cup (X \cap Y) = \{a, b, c, d, e, f, g, h\}$$

$$(\overline{Y^c} \cup X) \cap Y = \{a, e\}$$

Can you do problem 4?

hint YOU CAN!



a) $(A \cup B)' \cup C' =$

e) $(A \cup C)' \cup B =$

b) $B' \cup (A \cap C)' =$

f) $(B \cup C)' \cup A =$

c) $(A \cup B) \cap C =$

g) $C' \cup (A \cup B) =$

d) $B \cup (A \cap C) =$

h) $C \cap (A \cap B)$