1. a) 3, 8

b) 4, 16

c) 1, 2

2. $A = \{x_1, x_2, \dots, x_m\}$ A^n - ?

$N = m^n$

3. a) $\{-1, 0, 1\}$

b) $\{x \in \mathbb{Z}, x \notin \{0,1\}\}$

c) $\{\emptyset\}$

4. $A = \{a_1, a_2, a_3, \dots, a_n\}$

write down all the subsets that do not involve a_n.

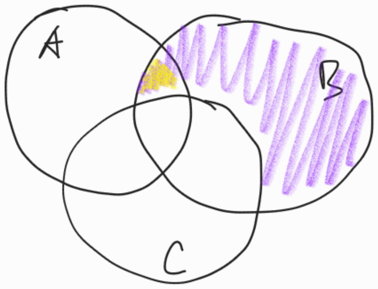
next we write down the subsets that adjoin a_n

5. Prove $\overline{A \cap B \cap C} = \bar{A} \cup \bar{B} \cup \bar{C}$

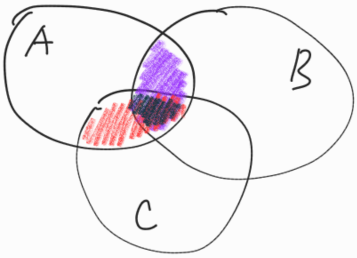
$\overline{A \cap B \cap C} = \overline{(A \cap B) \cap C} = \overline{A \cap B} \cup \bar{C} = (\bar{A} \cup \bar{B}) \cup \bar{C} = \bar{A} \cup \bar{B} \cup \bar{C}$

A	B	C	$A \cap B \cap C$	$\boxed{\overline{A \cap B \cap C}}$	$\bar{A}$	$\bar{B}$	$\bar{C}$	$\boxed{\bar{A} \cup \bar{B} \cup \bar{C}}$
0	0	0	0	1	1	1	1	1
1	0	0	0	1	0	1	1	1
0	1	0	0	1	1	0	1	1
0	0	1	0	1	1	1	0	1
1	1	0	0	1	0	0	1	1
1	0	1	0	1	0	1	0	1
0	1	1	0	1	1	0	0	1
1	1	1	1	0	0	0	0	0

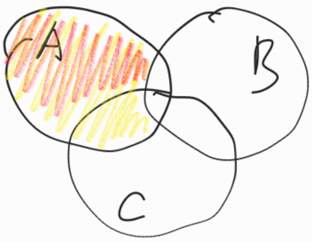
6. a)



b)



c)



7. a) $A \cup B = A \to B \subseteq A$

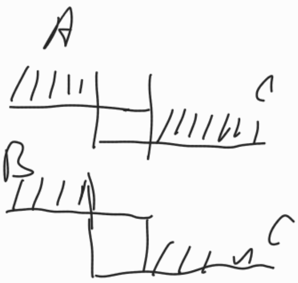
b) $A \cap B = A \to B \subseteq A$

c) $A - B = A \to A \cap B = \emptyset$

d) $A \cap B = B \cap A \to$ nothing to conclude

e) $A - B = B - A \to A = B$

8. $A \oplus C$



$x \in A$ if $x \in C$ the

$x \notin A \oplus C \Rightarrow$

$x \notin B \oplus C$

if $x \notin B$ then $x \in B \oplus C$

9. a) $\bigcup_{i=1}^{\infty} A_i = \mathbb{Z}$

$\bigcap_{i=1}^{\infty} A_i = \{-1, 0, 1\}$

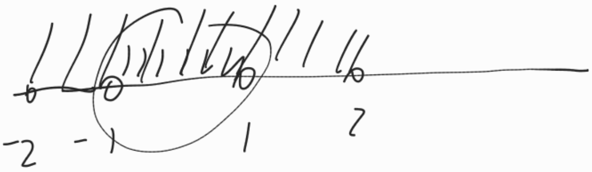
b) $A_i = \{-i, i\}$ $\bigcup_{i=1}^{\infty} A_i = \mathbb{Z} - \{0\}$

$\bigcap_{i=1}^{\infty} A_i = \emptyset$

c) $A_i = [-i, i]$ – set of real numbers

$\bigcup_{i=1}^{\infty} A_i = R$

$\bigcap_{i=1}^{\infty} A_i = [-1; 1]$



d) $A_i = [i, +\infty)$ – set of real nums with $x \geq i$

$\bigcup_{i=1}^{\infty} A_i = [1; +\infty)$

$\bigcap_{i=1}^{\infty} A_i = \emptyset$