Asignación #2:

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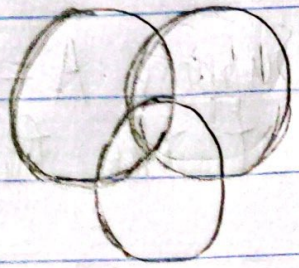

11) $A = \{x \in R \mid 0 < x < 2\}$

$B = \{x \in R \mid 1 < x < 4\}$

$C = \{x \in R \mid 3 \leq x < 9\}$

a) $A \cup B = \{x \in R \mid 0 < x < 4\}$

b) $A \cap B = \{x \in R \mid 1 \leq x \leq 2\}$

c) $A^c = \{x \in R \mid x \leq 0 \text{ or } x > 2\}$

d) $A \cup C = \{x \in R \mid 0 < x \leq 2 \text{ or } 3 \leq x < 9\}$

e) $A \cap C = \emptyset$

f) $B^c = \{x \in R \mid x < 1 \text{ or } x > 4\}$

g) $A^c \cap B^c = \{x \in R \mid x \leq 0 \text{ or } x \geq 4\}$

h) $A^c \cup B^c = \{x \in R \mid x < 1 \text{ or } x > 2\}$

i) $(A \cap B)^c = \{x \in R \mid x < 1 \text{ or } x \geq 2\}$

j) $(A \cup B)^c = \{x \in R \mid x \leq 0 \text{ or } x \geq 4\}$

12) $A = \{x \in R \mid -3 \leq x \leq 0\}$
$B = \{x \in R \mid -1 < x < 2\}$
$C = \{x \in R \mid 6 < x \leq 8\}$

a) $A \cup B = \{x \mid x \in R, x \in (-3, 2)\}$

b) $A \cap B = \{x \mid x \in R, x \in (-2, 1)\}$

c) $A^c = \{x \mid x \in R, x \in (-\infty, -4] \cup [1, \infty)\}$

d) $A \cup C = \{x \mid x \in R, x \in (-3, 0] \cup [6, 8)\}$

e) $A \cap C = \{x \mid x \in R, x \in (-2, 0] \cup [5, 8)\}$

f) $B^c = \{x \mid x \in R, x \in (-\infty, -2] \cup [3, \infty)\}$

g) $A^c \cap B^c = \{x \mid x \in R, x \in (-\infty, -4] \cup [1, \infty)\}$

h) $A^c \cup B^c = \{x \mid x \in R, x \in (-4, 1)\}$

i) $(A \cap B)^c = \{x | x \in R, x \in (-\infty, -2] \cup [1, \infty)\}$

j) $(A \cup B)^c = \{x | x \in R, x \in (-\infty, -3] \cup [2, \infty)\}$

19) Let $A_i = \{i, i^2\}$ for all integers $i = 1, 2, 3, 4$.

a) $A_1 \cup A_2 \cup A_3 \cup A_4 =$

$\{1\} \cup \{2, 4\} \cup \{3, 9\} \cup \{4, 16\} = \{1, 2, 3, 4, 9, 16\}$

b) $A_1 \cap A_2 \cap A_3 \cap A_4 =$

$\{1\} \cap \{2, 4\} \cap \{3, 9\} \cap \{4, 16\} = \emptyset$

c) Are A_1, A_2, A_3, and A_4 mutually disjoint? Explain

They are not, because $A_2 \cap A_4 = \{4\} = \emptyset$

20) Let $B_i = \{x \in R \mid 0 \leq x \leq i\}$ for all integers $i = 1, 2, 3, 4$.

a) $B_1 \cup B_2 \cup B_3 \cup B_4 =$

$\{x \in R \mid 0 \leq x \leq 1\} \cup \{x \in R \mid 0 \leq x \leq 2\} \cup \{x \in R \mid 0 \leq x \leq 3\} \cup \{x \in R \mid 0 \leq x \leq 4\}$

$\bigcup_{\{1,2,3,4\}=1}^{4} A_{\{1,2,3,4\}} = \{x \in R \mid 0 \leq x \leq 4\}$

b) $B_1 \cap B_2 \cap B_3 \cap B_4 =$

$\bigcap_{\{1,2,3,4\}=1}^{4} A_{\{1,2,3,4\}} = \{x \in R \mid 0 \leq x \leq 4\}$

c) Are B_1, B_2, B_3, and B_4 mutually disjoint? Explain.

They are, because they are properly organized.