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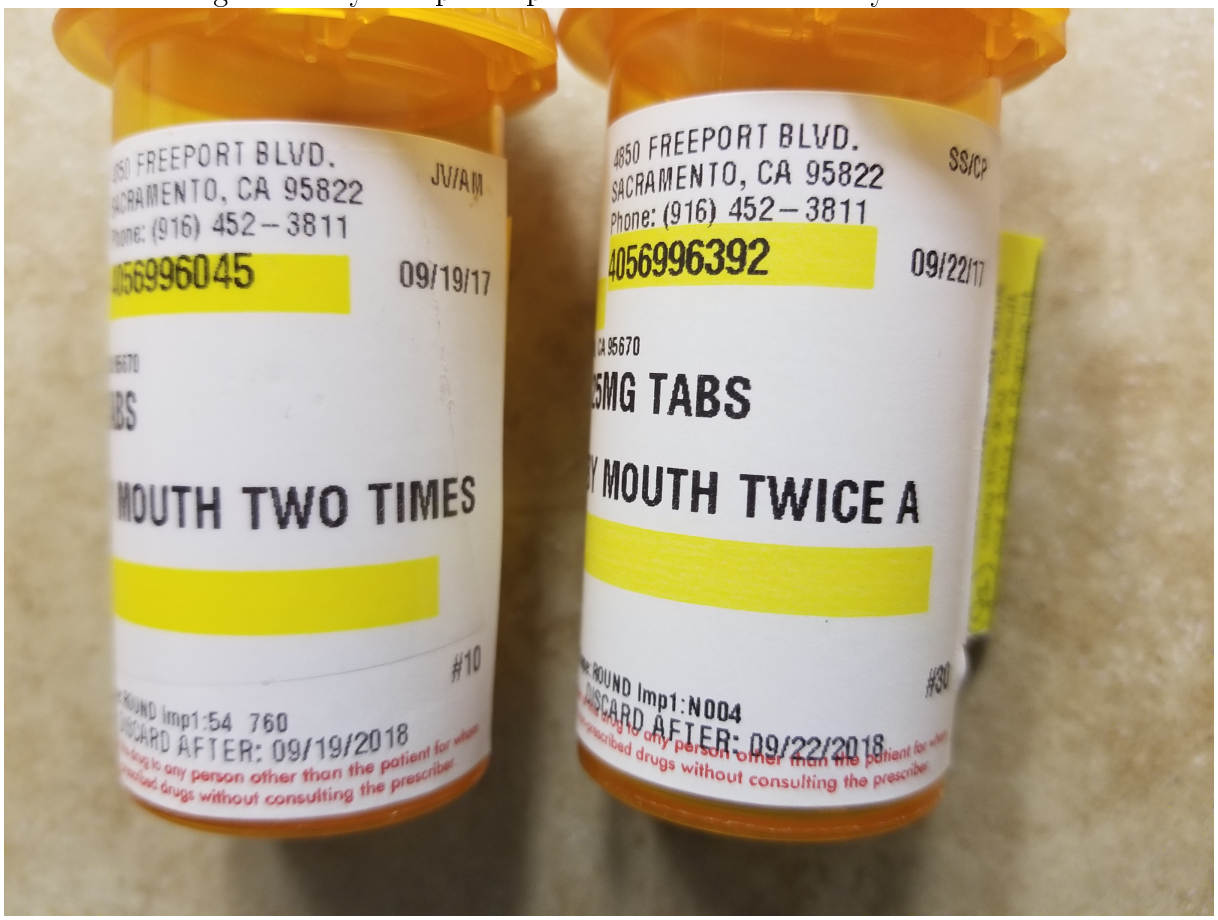
Homework 3

CISP440

Figure 1: My two perscriptions with the dates they were filled



Section 2.1

In Exercises 1-16, let the universe be the set $U = \{1, 2, 3, ..., 10\}$. Let $A = \{1, 4, 7, 10\}$, $B = \{1, 2, 3, 4, 5\}$, and $C = \{2, 4, 6, 8\}$. List the elements of each.

6: $U - C$

$U - C = \{1, 3, 5, 9, 10\}$

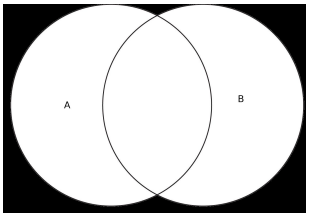
12: $A \cap (B \cup C)$

$B \cup C = \{1, 2, 3, 4, 5, 6, 8\}$

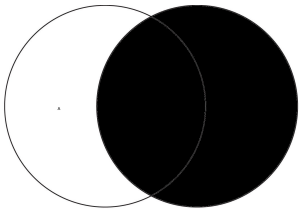
$A \cap (B \cup C) = \{1, 4, 10\}$

In exercises 17-24, draw a Venn diagram and shade the given set.

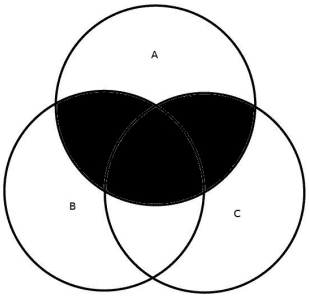
18: $\overline{A} - B$



19: $B \cup (B - A)$



24: $(B - \overline{C}) \cup ((B - \overline{A}) \cap (C \cup B))$



30: A television poll of 151 persons found that 68 watched "M*E*S*S"; 61 watched "Leave It to Seaver" (a base-ball show), 52 watched "The Yuppie Hour"; 16 watched both "M*E*S*S" and "Leave It to Seaver"; 25 watched both "M*E*S*S" and "The Yuppie Hour"; 19 watched both "Leave It to Seaver" and "The Yuppie Hour"; and 26 watched none of these shows. How many persons watched all 3 shows?

Total Number of People: 151
People who didn't watch any of these shows: 26
MESS only: $68 - (16 + 25) = 27$
LITS only: $61 - (16 + 19) = 26$
TYH only: $52 - (25 + 19) = 8$
Total people who only watched one show: $8 + 26 + 27 = 61$
Total people who watched exactly two shows: $16 + 19 + 25 = 60$
People who watched 3 shows: (Total People) - {(No Shows) + (Only One) + (Exactly Two)}

151 - (26 + 61 60) = 4

List all partitions of each set

40: $\{1, 2\}$

- $\{\{1\}, \{2\}\}$
- $\{\{1, 2\}\}$

Determine weather each pair of sets is equal

48: $\{1, 2, 2, 3\}, \{1, 2, 3\}$

Yes, they are equal, because they contain the same elements. Duplicates don't matter.

49: $\{1, 1, 3\}, \{3, 3, 1\}$

Yes, they are equal. They both contain only a *1* and a *3*

53: List the members of $\mathcal{P}(\{a, b, c, d\})$. Which are proper subsets of $\{a, b\}$

$\mathcal{P}(\{a, b, c, d\})$:

- $\{\emptyset\}$
- $\{a\}$
- $\{b\}$
- $\{c\}$
- $\{d\}$
- $\{a, b\}$
- $\{a, c\}$
- $\{a, d\}$
- $\{b, c\}$
- $\{b, d\}$

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

Proper Subsets of $\{a, b\}$:

- $\{a\}$
- $\{b\}$

54: If X has 10 members, how many members does $\mathcal{P}(X)$ have? How many proper subsets does X have?

The powerset of X has 2^{10}, or 1024 members.
X has 1023 proper subsets

Write *true* if statement is true; otherwise, give a counterexample. The sets X, Y and Z are subsets of a universal set U. Assume that the universe for Cartesians products is $U * U$

58: $X \cap (Y - Z) = (X \cap Y) - (X \cap Z)$ **for all sets** X, Y **and** Z.

True

For each condition in Exercises 71–74, what relation must hold between sets A and B?

72: $A \cup B = A$

$B = A$

73: $\overline{A} \cap U = \emptyset$

$A = U$