

CISC 1100: HW 1

SOLUTIONS

Let

$$A = \{0, 1, 2, 3, 4, 5\}$$

$$B = \{2, 4, 6, 8, 10\}$$

$$C = \{1, 2, 3, 5, 7\}$$

$$D = \{1, 3, 5, 7, 9\}$$

1) a) Find $A \cup B$.

$$\{0, 1, 2, 3, 4, 5, 6, 8, 10\}$$

b) Find $A - C$.

$$\{0, 4\}$$

c) Find $D \cap B$.

$$\emptyset$$

d) Find $(D \cup B) \cap C$.

$$\{1, 2, 3, 5, 7\} = C$$

e) Find $D \cup (B \cap C)$.

$$\{1, 2, 3, 5, 7, 9\}$$

2) Let $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ be a universal set, with $A, B \subseteq U$.

a) Write in set lister notation: $A = \{x \in U \mid x \text{ is a multiple of } 3\}$.

$$A = \{3, 6, 9\}$$

b) Write in set builder notation: $B = \{2, 3, 5, 7\}$.

$$\{x \in U \mid x \text{ is prime}\}$$

c) Find $A - B$ and $B - A$.

$$A - B = \{6, 9\}, B - A = \{2, 5, 7\}$$

d) What is $[(B - A) \cap (A - B)]'$? Hint: this is a trick question.

$$\emptyset' = U$$

3) Suppose that U is a universal set with $A, B \subseteq U$. Prove the following law in any fashion:

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

Ask for picture

4) Prove the following law in any fashion:

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

Ask for picture