

Finite Mathematics, Summer 2010, quiz #4, Friday July 30, 2010

1. Suppose

$$U = \{x \in \mathbb{N} | x < 12\}$$

$$A = \{1, 2, 3, 4, 5, 6\}$$

$$B = \{2, 4, 6, 8, 10, 12\}$$

$$C = \{1, 2, 3, 4, 5, 7, 9\}$$

- (a) Draw a Venn Diagram of these sets.
- (b) Find $A \cap B$
- (c) Find $A \cup C$
- (d) Find $n(A^c), n(B^c), n(A^c \cap B^c)$
- (e) Find $n(A \cap B \cap C)$ and $n(A \cup B \cup C)$

2. If order **matters**, in how many ways can 2 cards be drawn from a 52-card deck

- (a) If the first card is replaced before the second card is drawn.
- (b) If the second card is drawn without replacing the first card.

(*Hint:* parts a and b are different just in the sense of repetition.)

3. If order **doesn't matter**, in how many ways can 2 cards be drawn from a 52-card deck

- (a) If the first card is replaced before the second card is drawn.
- (b) If the second card is drawn without replacing the first card.

4. How many **three** digit **even** numbers can be formed from the numbers 5,6,7,8 if

- (a) repetition of digits is not allowed
- (b) repetition of digits is allowed

5. (*Optional*) How many **three** digit numbers can be formed from the numbers 5,6,7,8 if there's **at least** one repeated digit.

6. (*Optional*) Prove that $A \cap B = \emptyset$ if and only if $A \subseteq B^c$