MAT 147
Homework # 4

1. Let $A = \{2, 4, 6, 8\}$, $B = \{1, 3, 5, 7\}$, $C = \{1, 2, 3, 6, 7\}$, and $D = \emptyset$. Find each of the following:

(a) $A \times B$

(b) $B \times A$

(c) C^2 (This is just notation for $C \times C$)

(d) $A \times B \times C$

(e) $B \times \emptyset$

2. Let A and B be as in problem 1. How many elements are in $P(A) \times P(B)$?

3. Compute the set $\{0, 1\}^4 = \{0, 1\} \times \{0, 1\} \times \{0, 1\} \times \{0, 1\}$. How many elements does this set have? How many elements does $\{0, 1\}^{128}$ have?

4. Given the following sets, find the sets in (a) - (e) below.

$$A = \{4, 8, 12, \ldots, 96, 100\} \qquad B = \{-1, 0, 1, 2, 3, 4, 5, 6\} \qquad C = \emptyset$$

$$D = (-\infty, -7] \qquad E = [-1, 6] \qquad F = (-1, \infty)$$

(a) $A \cup E$

(b) $B - D$

(c) $B \cap F$

(d) $(E \cap F) \cup C$

(e) $A \cap B \cap E$