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Homework 4

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**Problem 1.**Let  $B = \{\text{pancakes, bacon, coffee}\}$ ,  $L = \{\text{sandwich, salad, coffee}\}$ , and  $D = \{\text{pasta, soup, coffee}\}$ .

- (a) What is  $B \cup L$ ?  $\rightarrow \{\text{pancakes, bacon, coffee, sandwich, salad}\}$
- (b) What is  $B \cup L \cup D$ ?  $\rightarrow \{\text{pancakes, bacon, coffee, sandwich, salad, pasta, soup}\}$
- (c) What is  $B \cap L \cap D$ ?  $\rightarrow \{\text{coffee}\}$
- (d) What is  $B - L$ ?  $\rightarrow \{\text{pancakes, bacon}\}$
- (e) What is  $B \times L$ ?  $\rightarrow \{(\text{pancakes, sandwich}), (\text{pancakes, salad}), (\text{pancakes, coffee}),$   
 $(\text{bacon, sandwich}), (\text{bacon, salad}), (\text{bacon, coffee}),$   
 $(\text{coffee, sandwich}), (\text{coffee, salad}), (\text{coffee, coffee})\}$

**Problem 2.**Let  $U = \{1, 2, \dots, 10\}$ . Write out the elements of the following sets:

- (a)  $\{n \in U \mid n \geq 5\} \rightarrow \{5, 6, 7, 8, 9, 10\}$
- (b)  $\{n \in U \mid \text{there is some } m \in \mathbb{Z} \text{ with } n = 2m\} \rightarrow \{2, 4, 6, 8, 10\}$
- (c)  $\{n \in U \mid n \leq 3 \text{ or } n \geq 8\} \rightarrow \{1, 2, 3, 8, 9, 10\}$
- (d)  $\{n^2 \mid n \in U \text{ and } n \leq 5\} \rightarrow \{1, 4, 9, 16, 25\}$