

Practice Exam #1

1. List all elements of the following sets:

- (a) $\{k \in \mathbb{P} \mid k \text{ is odd and } 4 \leq k \leq 13\}$
- (b) The power set of $\{-1, 1\}$.
- (c) $A \times B$ where $U = \{1, 2, 3, 4\}$, $A = \{1, 3\}$, and $B = A^c$.

2. What is the base 2 representation of the decimal number 25?

3. Compute the value of $\sum_{k=1}^{12} ((k+1)^2 - k^2)$.

- 4. (a) How many ways can the letters in the word COLD be put in order?
- (b) How many ways can the letters in the word FRIGID be put in order?.

5. (a) Given five white blocks and four red blocks, how many ways can the nine blocks be put into a line? Explain how you get your answer.

(b) How many ways can they be put in line if the two end blocks need to have the same color?

6. Construct the truth table of: $((p \vee (\neg q)) \wedge (\neg p)) \rightarrow \neg q$