MAT 243 WRITTEN HOMEWORK 3

NAME: _____

(1) (4 pts) Fill in the blank in the statements below:

(a) The power set $P(S)$ of a set S is _____

(b) $A - B =$ _____

(c) A function $f : A \to B$ is one-to-one if and only if _____

(d) A sequence is a function _____

(2) (10 pts) Let $A = \{1, 2\}$ and $B = \{2, 3\}$. Find $\mathcal{P}(A)$, $\mathcal{P}(B)$, $\mathcal{P}(A) \cup P(B)$ and $\mathcal{P}(A \cup B)$.

What is your conjecture about the relation between $\mathcal{P}(A) \cup P(B)$ and $\mathcal{P}(A \cup B)$?

(3) (10 pts) Prove that $f : \mathbb{Z} \to \mathbb{Z}$; $f(n) = 2n + 3$ is one-to-one but not onto.

(4) (10 pts) Prove that $f : \mathbb{Z} \to \mathbb{Z}$; $g(n) = \left\lceil \frac{n-1}{2} \right\rceil$ is not one-to-one but it is onto.

(5) Evaluate the sum and simplify as much as possible. Show all your work. Calculator answers will not be accepted.

$$\sum_{k=2}^{50} (k+3)^2$$