In-Class Worksheet

Discrete Math & Functional Programming— CSCI 054— Spring 2024

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even: an integer k is even if and only if there exists an integer r such that $k = 2r$

odd: an integer k is odd if and only if there exists an integer r such that $k = 2r + 1$

divides: given integers k and m, $k|m$ if and only if there exists an integer r such that $m = kr$. This is equivalent to saying that $m \bmod k = 0$ or that k evenly divides m.

prime: an integer $k > 1$ is prime if the only positive integers that evenly divide k are 1 and k itself.

composite: an integer $k > 1$ is composite if it is not prime.

perfect square: an integer k is a perfect square if and only if there exists an integer r such that $k = r^2$

For all positive integers n, $2n = n^2$.

Let x be any integer. If x is a perfect square, then $4x$ is a perfect square.

$$\forall i \in \{1, 2, \ldots, n\} : [\exists j \in \{1, 2, \ldots, n\} : (i \neq j) \wedge (A[i] = A[j])]$$

$$\exists y \in \mathbb{R} : \forall x \in \mathbb{R} : x < y \tag{1}$$
$$\forall x \in \mathbb{R} : \exists y \in \mathbb{R} : x < y \tag{2}$$

$$\neg(\forall i \in \{1, 2, \ldots, n\} : [\exists j \in \{1, 2, \ldots, n\} : (i \neq j) \wedge (A[i] = A[j])])$$