MAS1202/2202 Number Systems and the Foundations of Calculus: Solutions to Set Theory Exercises

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A.1. (a) $\{n \in \mathbb{N} \,:\, 10 < n^2 + n < 42\} = \{3, 4, 5\}$;

(b) $\{x \in \mathbb{R} \,:\, x^2 + 6x + 9 = 0\} = \{-3\}$;

(c) $\{n \in \mathbb{N} \,:\, n$ and $n + 2$ are prime with $n < 30\} = \{3, 5, 11, 17, 29\}$;

A.2. (a) $\{n \in \mathbb{N} \,:\, 2 < n^2 < 75\} = \{2, 3, 4, 5, 6, 7, 8\}$;

(b) $\{x \in \mathbb{R} \,:\, x^2 + 3x + 2 = 0\} = \{-2, -1\}$;

(c) $\{n \in \mathbb{N} \,:\, n$ is a 2 digit prime $\} = \{11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97\}$;

A.3. (a) TRUE; (b) TRUE; (c) FALSE; (d) TRUE.

A.4. (a) TRUE; (b) TRUE; (c) FALSE; (d) TRUE.