CSE 311 Quiz Section: April 25, 2013

1. More on Sets

Prove that $A \subseteq B \leftrightarrow \overline{B} \subseteq \overline{A}$. Note: $\overline{A} = \{x : x \notin A\}$.

2. Functions

For all functions and mappings below, state whether they are one-to-one, onto, or both. Let the sets for domain and co-domain be defined as follows:

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 $A = \{x : x \in \mathbb{R}, x \ge 1\}.$ $B = \{x : x \in \mathbb{R}, 0 \le x \le 1\}$ $C = \{x : x \in \mathbb{R}, -1 \le x \le 1\}$ (i) $f : A \to B, f(x) = \frac{1}{x}$ (ii) $f : B \to C, f(x) = x^2$ (iii) $f : B \to B, f(x) = x^2$ (iv) $f : C \to B, f(x) = x^2$

3. Modular Arithmetic

Find an integer *a* such that: (i) $a \equiv 43 \pmod{23}, -22 \le a \le 0$ (ii) $a \equiv 17 \pmod{29}, -14 \le a \le 14$ (iii) $a \equiv -11 \pmod{21}, 90 \le a \le 110$