

SE 504 (Formal Methods and Models)
Spring 2009
HW #2
Due: 5pm, Friday Feb 20

For each given pair P and Q of predicates below, indicate the weakness/strength relationship that exists between them. Justify your answers.

(1) $P : x \geq 0 \vee y > x$ and $Q : x > -2 \vee y > x - 1$

(2) $P : x \geq 0 \vee y > x$ and $Q : x > -2 \wedge y > x - 1$

(3) $P : x \geq 0 \wedge y > x$ and $Q : x > 2$

(4) $P : x = 0 \Rightarrow y \geq 0$ and $Q : x \geq 0 \Rightarrow y > 0$

(5) $P : (\forall i \mid R_0 : S)$ and $Q : (\forall i \mid R_0 \vee R_1 : S)$

(6) $P : (\forall i \mid : S)$ and $Q : (\exists i \mid : S)$

(7) $P : (\forall i \mid R : S)$ and $Q : (\exists i \mid R : S)$

In this problem (i.e., #7), the answer depends upon R and S . Identify particular choices for R and S that make P strictly weaker than Q . Then identify choices for R and S that result in P being strictly stronger than Q . (Your answer to #6 should be of help here.)