Chapter 2: Inequalities

Axioms

Given real numbers a, b, and c:

- Exactly ONE of the following must be true: $a < b$ OR a = b OR a > b (law of trichotomy)
- If $a < b$ and $b < c$ then $a < c$ (transitivity)
- If $a < b$ then $a + c < b + c$
- If $a < b$ and c is positive, then $ac < bc$

Miscellaneous True Propositions

- A real number c is positive iff $-c$ is negative.
- If $a < b$ and c is negative, then $ac > bc$.
- Given real numbers a, b, c, and d, if $a > b$ and $c > d$ then $a + c > b + d$.
- Given real numbers a and b, ($a >= b$ AND $b >= a$) iff $a = b$.
- Given positive reals a and b, $a > b$ iff $a^2 > b^2$.
- If a is positive, then $1/a$ is positive.
- Given positive real numbers a and b, if $a > b$ then $1/a < 1/b$.