Fachbereich Mathematik
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1st Tutorial Analysis I (engl.)

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(T1.1)

Decide for which $x \in \mathbb{R}$ the following inequalities hold.

(a) $\left|\dfrac{x+4}{x-2}\right| < x$.

(b) $|x-a| + |x-b| \leq b-a$, with $a \leq b$.

(T1.2)

Prove the following conclusions from the axioms of $\mathbb{R}$.

(a) Let $x \in \mathbb{R}$. Then $-x$ is uniquely determined.

(b) Let $x \in \mathbb{R}$. Then we have $-(-x) = x$.

(T1.3)

Derive the following relations for $x, y, u, v \in \mathbb{R}$ from the field axioms of $\mathbb{R}$ and the order axioms of $\mathbb{R}$.

(a) If $x < y$ and $u \leq v$, then $x + u \leq y + v$.

(b) If $x < y$ then $-x > -y$.

(c) If $x < y$ and $u > 0$, then $xu < yu$.