

\mathbb{Q} \sup ... \inf ... $x \leq h$ $d \leq x$
 $\sup \mathbb{Q} = 1$ $\inf \mathbb{Q} = 0$
 $(\mathbb{Q} \cap \mathbb{Q})$
 $\inf \mathbb{N} = 0$ $\sup \mathbb{N} = 1$
 $\mathbb{N} \quad 1 = 0 = 0$
 $\mathbb{N} \quad 1 \leq x \in \mathbb{N}$
 $\mathbb{N} \quad 1 \in \mathbb{N}$
 $\mathbb{N} \quad x_0 \text{ vlastní L}$
 $\forall \epsilon > 0 \exists \delta > 0 : x - x_0 < \delta \Rightarrow |f(x) - L| < \epsilon$
 $\forall \epsilon > 0 \exists \delta > 0 : |x - x_0| < \delta \Rightarrow |f(x) - L| < \epsilon$

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$\lim_{x \rightarrow 3} \frac{x^2 - 3x - 2}{x - 3} = -2$
 $\forall \epsilon > 0 \exists \delta > 0 : |x - 3| < \delta \Rightarrow \left| \frac{x^2 - 3x - 2}{x - 3} - (-2) \right| < \epsilon$
 $\frac{x^2 - 3x - 2}{x - 3} + 2 = \frac{x^2 - 3x - 2 + 2x - 6}{x - 3} = \frac{x^2 - x - 8}{x - 3}$
 $\frac{x^2 - x - 8}{x - 3} = \frac{(x - 3)(x + 2) - 2}{x - 3} = x + 2 - \frac{2}{x - 3}$
 $\left| x + 2 - \frac{2}{x - 3} + 2 \right| < \epsilon$
 $\left| x + 4 - \frac{2}{x - 3} \right| < \epsilon$
 $\left| x + 4 \right| - \frac{2}{|x - 3|} < \epsilon$
 $\left| x + 4 \right| < \epsilon + \frac{2}{|x - 3|}$
 $\left| x + 4 \right| < \epsilon + \frac{2}{\delta}$
 $\delta < \frac{2}{\epsilon - |x + 4|}$
 $\delta < \frac{2}{\epsilon - 7}$

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$\forall k > 0 \exists \delta > 0 : \forall x, x \neq x_0 : |x - x_0| < \delta \Rightarrow f(x) > k$
 $\forall k > 0 \exists N \in \mathbb{N} : n > N \Rightarrow x_n > k$

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$\lim_{x \rightarrow 2} \frac{x^2 - 5x + 6}{x - 2} = -1$
 $\lim_{x \rightarrow 1} \frac{\sqrt{x} - 1}{x - 1} = \frac{1}{2}$
 $\lim_{x \rightarrow 1} \frac{\sqrt{x} - 1}{x - 1} = \lim_{t \rightarrow 1} \frac{\sqrt{t} - 1}{t - 1} = \lim_{t \rightarrow 1} \frac{\sqrt{t} - 1}{(\sqrt{t} - 1)(\sqrt{t} + 1)} = \lim_{t \rightarrow 1} \frac{1}{\sqrt{t} + 1} = \frac{1}{2}$
 $\lim_{x \rightarrow 2} \frac{x^2}{2\sqrt{x^2 - 4}} = \lim_{x \rightarrow 2} \frac{x^2}{2(x - 2)\sqrt{x + 2}} = \lim_{x \rightarrow 2} \frac{x^2}{2(x - 2)\sqrt{x + 2}}$
 $\lim_{x \rightarrow 1} \frac{x - 1}{\sqrt{x^2 - 2} - \sqrt{x^2 + 2}} = \lim_{x \rightarrow 1} \frac{(x - 1)(\sqrt{x^2 - 2} + \sqrt{x^2 + 2})}{(x^2 - 2) - (x^2 + 2)} = \lim_{x \rightarrow 1} \frac{(x - 1)(\sqrt{x^2 - 2} + \sqrt{x^2 + 2})}{-4} = \frac{1}{4}$
 $\lim_{x \rightarrow \infty} \frac{x^2 - x + 1}{x^2 + x + 1} = \lim_{x \rightarrow \infty} \frac{1 - \frac{1}{x} + \frac{1}{x^2}}{1 + \frac{1}{x} + \frac{1}{x^2}} = \frac{1}{1} = 1$

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$\lim_{x \rightarrow \infty} \frac{\sqrt{x+2} + \sqrt{3x+4} + \sqrt{5x}}{\sqrt{2x+1}} = \lim_{x \rightarrow \infty} \frac{\sqrt{x+2} + \sqrt{3x+4} + \sqrt{5x}}{\sqrt{x} \cdot \sqrt{2 + \frac{1}{x}}} = \lim_{x \rightarrow \infty} \frac{\sqrt{x} \left(\sqrt{1 + \frac{2}{x}} + \sqrt{3 + \frac{4}{x}} + \sqrt{5} \right)}{\sqrt{x} \cdot \sqrt{2 + \frac{1}{x}}} = \lim_{x \rightarrow \infty} \frac{\sqrt{1 + \frac{2}{x}} + \sqrt{3 + \frac{4}{x}} + \sqrt{5}}{\sqrt{2 + \frac{1}{x}}} = \frac{1 + \sqrt{3} + \sqrt{5}}{\sqrt{2}} = \frac{1 + \sqrt{3} + \sqrt{5}}{\sqrt{2}}$

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$\lim_{x \rightarrow 1} \frac{(x+1)(x^2 - 3x + 2)}{x - 1} = \lim_{x \rightarrow 1} \frac{f(x)g(x)}{x - 1} = \frac{f(1)g(1)}{1 - 1} = \frac{2 \cdot 0}{0} = \frac{0}{0}$
 $\lim_{x \rightarrow 1} \frac{x^2 - 3x + 2}{x - 1} = \lim_{x \rightarrow 1} \frac{(x - 1)(x - 2)}{x - 1} = \lim_{x \rightarrow 1} (x - 2) = -1$
 $\lim_{x \rightarrow 1} \left(\frac{2}{3} \right)^{\frac{1}{x - 1}} = \left(\frac{2}{3} \right)^{-1} = \frac{3}{2}$

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