

11th lesson

<https://www2.karlin.mff.cuni.cz/kuncova/en/teachMat1.php>
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Exercises

1. Find limits:

$$(a) \lim_{x \rightarrow 1} \frac{x-1}{x^2+x-2}$$

$$(b) \lim_{x \rightarrow -3} \frac{x^2+x-6}{x+3}$$

$$(c) \lim_{x \rightarrow 2} \frac{x^2+3x-4}{x^2-4x+4}$$

$$(d) \lim_{x \rightarrow 0} \frac{1}{\sin x}$$

$$(e) \lim_{x \rightarrow -2} \frac{-4}{x+2}$$

$$(f) \lim_{x \rightarrow 4} \frac{3}{(4-x)^3}$$

$$(g) \lim_{x \rightarrow 3} \frac{2x}{x-3}$$

$$(h) \lim_{x \rightarrow 4} \frac{x^2}{x^2-16}$$

$$(i) \lim_{x \rightarrow -3} \frac{x^2-2x-3}{x^2+6x+9}$$

$$(j) \lim_{x \rightarrow -\infty} \frac{1}{e^x}$$

$$(k) \lim_{x \rightarrow 0} \frac{|2x|}{x}$$

2. Find limits:

$$(a) \lim_{x \rightarrow -1} e^{x^2+3}$$

$$(b) \lim_{x \rightarrow \frac{\sqrt{\pi}}{2}} \tan x^2$$

$$(c) \lim_{x \rightarrow \infty} \ln \frac{x-1}{2+x}$$

$$(d) \lim_{x \rightarrow \infty} \cos \frac{1}{x}$$

$$(e) \lim_{x \rightarrow -1} \arctan \frac{3x-2}{(x+1)^2}$$

$$(f) \lim_{x \rightarrow \infty} 2^{\sqrt{x^2+x}-\sqrt{x^2-x}}$$

$$(g) \lim_{x \rightarrow 2^+} e^{1+\ln(x-2)}$$

$$(h) \lim_{x \rightarrow \infty} \cot \left(\frac{e^x - \cos x}{2e^x + \sin x} \right)$$

$$(i) \lim_{x \rightarrow 2} \operatorname{arccot} \frac{x^2-3x+2}{x^3-4x^2+4x}$$

$$(j) \lim_{x \rightarrow \infty} \arcsin \ln \frac{e^{x+1} + x^9}{e^x - 2^x}$$