

Asymptota grafu

$$f(x) = \frac{1 - 6x - x^2}{x + 3}$$

I) Def. obor $x + 3 \neq 0$
 $x \neq -3$

II) Rovná asymptota

$$\lim_{x \rightarrow -3^+} \frac{1 - 6x - x^2}{x + 3} = -\infty \quad x = -3 \text{ je rovná asymptota}$$

III) Šikmá asymptota

$$k_{12} \lim_{x \rightarrow \pm\infty} \frac{f(x)}{x} = \lim_{x \rightarrow \pm\infty} \frac{\frac{1 - 6x - x^2}{x + 3}}{x} = \lim_{x \rightarrow \pm\infty} \frac{1 - 6x - x^2}{x(x + 3)} =$$

$$= \lim_{x \rightarrow \pm\infty} \frac{1 - 6x - x^2}{x^2 + 3x} \stackrel{\text{L'Hop. pravidlo}}{=} \lim_{x \rightarrow \pm\infty} \frac{-6 - 2x}{2x + 3} = \lim_{x \rightarrow \pm\infty} \frac{-2}{2} = \underline{\underline{-1}}$$

$$p_{12} \lim_{x \rightarrow \pm\infty} [f(x) - k \cdot x] = \lim_{x \rightarrow \pm\infty} \left[\frac{1 - 6x - x^2}{x + 3} - (-1)x \right] =$$

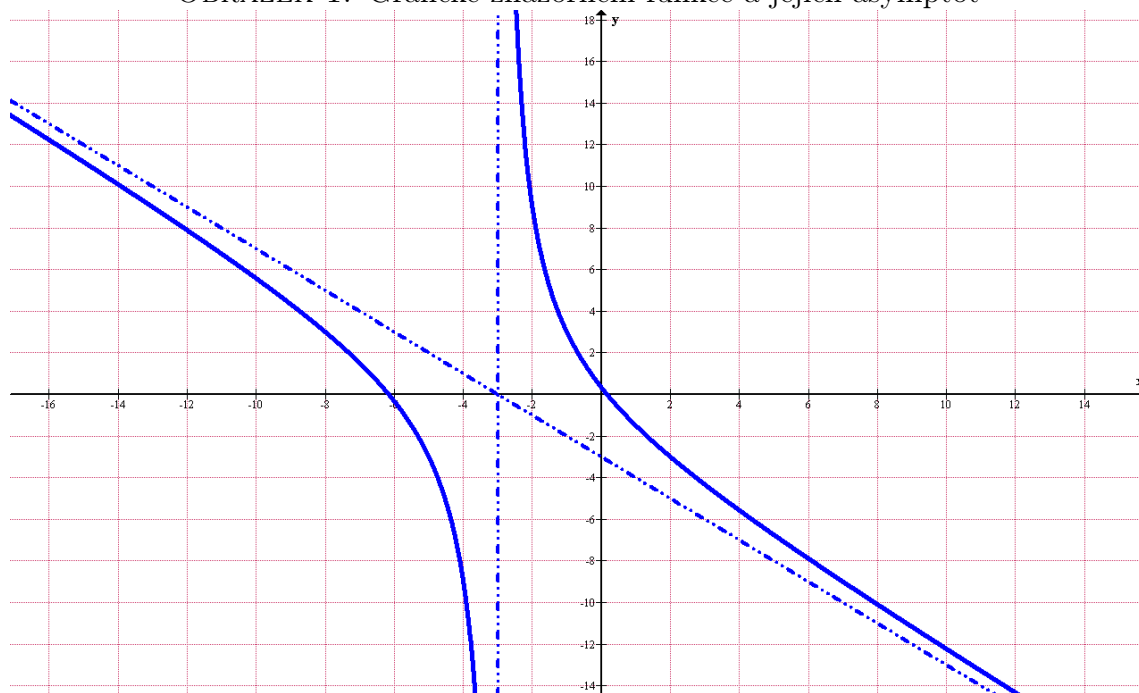
$$= \lim_{x \rightarrow \pm\infty} \left[\frac{1 - 6x - x^2}{x + 3} + 1x \right] = \lim_{x \rightarrow \pm\infty} \frac{1 - 6x - x^2 + (x + 3)x}{x + 3} =$$

$$= \lim_{x \rightarrow \pm\infty} \frac{1 - 6x - x^2 + x^2 + 3x}{x + 3} = \lim_{x \rightarrow \pm\infty} \frac{1 - 3x}{x + 3} = \lim_{x \rightarrow \pm\infty} \frac{-3}{1} =$$

$$= \underline{\underline{-3}}$$

$y = -x - 3$ je šikmá asymptota

OBRÁZEK 1. Grafické znázornění funkce a jejích asymptot



Zdroj: program Graph