(III.)

a) $$\lim_{x\to\infty}\frac{\sqrt{9x^2+x}}{5x}=\lim_{x\to\infty}\frac{\sqrt{x^2\left(9+\frac{1}{x}\right)}}{5x}=\lim_{x\to\infty}\frac{\cancel{x}\sqrt{9+\frac{1}{x}}}{5\cancel{x}}\quad \frac{1}{x}\to 0$$

$|x| = x$, kun $x \geq 0$

$$=\frac{\sqrt{9}}{5}=\frac{3}{5}$$

$\sqrt{\ } + x$

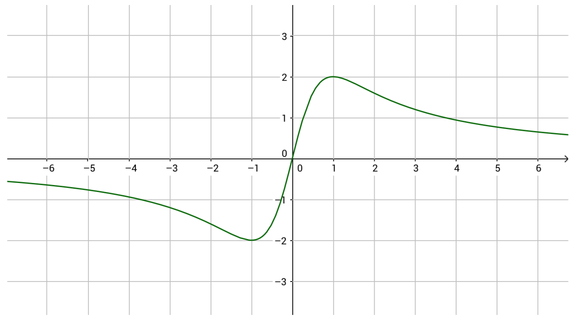
b) $$\lim_{x\to\infty}\left(\sqrt{x^2+3x}-x\right)=\lim_{x\to\infty}\frac{\left(\sqrt{x^2+3x}+x\right)\left(\sqrt{x^2+3x}-x\right)}{\sqrt{x^2+3x}+x}$$

$$=\lim_{x\to\infty}\frac{\cancel{x^2}+3x-\cancel{x^2}}{\sqrt{x^2+3x}+x}$$

$\leftarrow (a+b)(a-b) = a^2-b^2$

$$=\lim_{x\to\infty}\frac{3x}{\sqrt{x^2\left(1+\frac{3}{x}\right)}+x}=\lim_{x\to\infty}\frac{3\cancel{x}}{\cancel{x}\sqrt{1+\frac{3}{x}}+\cancel{x}1}$$

$$=\lim_{x\to\infty}\frac{3}{\underbrace{\sqrt{1+\frac{3}{x}}}_{\to\sqrt{1}=1}+1}\quad \frac{3}{x}\to 0 \quad =\frac{3}{\sqrt{1}+1}=\frac{3}{2}$$



3
2
1
0
−1
−2
−3
−6
−5
−4
−3
−2
−1
0
1
2
3
4
5
6