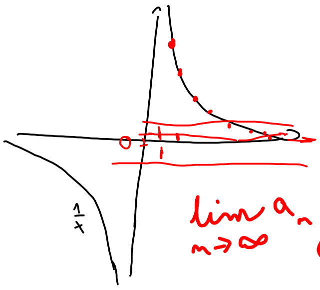


$a_n = \frac{1}{n} \quad n \in \mathbb{N}_+$

$f(x) = \frac{1}{x} \quad x \in \mathbb{R} \setminus \{0\}$

$\lim\limits_{n\to\infty} a_n = \lim\limits_{n\to\infty} \frac{1}{n} = 0$

Symboli neodr. | Def. sig. pd.

$\frac{\infty}{\infty}$, $\infty - \infty$, $0 \cdot \infty$, 1^∞, 0^0

$\frac{a \neq 0}{0} = \pm\infty$ (0^-, 0^+)

$\frac{a}{\infty} = 0$

$a + \infty = \infty$

$\frac{\infty}{a} = \infty$

$\lim a_n = a$

$\lim \sqrt{a_n} = \sqrt{\lim a_n}$

$a^\infty = \begin{cases} \infty & a > 1 \\ 1 & a = 1 \\ 0 & a \in (0,1) \end{cases}$

h) $a_n = \sqrt{\frac{(3n+5)^2}{(1-2n)^2}}$

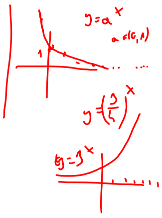
$\lim\limits_{n\to+\infty} \sqrt{\frac{(3n+5)^2}{(1-2n)^2}} = \sqrt{\lim \frac{\cancel{n}(3+\frac{5}{n})^2}{\cancel{n}(\frac{1}{n}-2)^2}} = \sqrt{\frac{3^2}{(-2)^2}} = \frac{3}{2}$

b) $\frac{16^n+4}{(2^{2n}-2)(2^{2n}+2)} = \lim\limits_{n\to\infty} \frac{16^n+4}{16^n-4} =$

$\lim\limits_{n\to\infty} \frac{\cancel{16^n}(1+\frac{4}{16^n})}{\cancel{16^n}(1-\frac{4}{16^n})} = 1$

d) $\lim\limits_{n\to\infty} a_n = \frac{3^n-4^{n+1}}{4^{n+1}} = \lim\limits_{n\to\infty} \frac{3^n-4^n\cdot 4}{4^n\cdot 4} =$

$\lim\limits_{n\to\infty} \frac{\cancel{4^n}((\frac{3}{4})^n - 4)}{\cancel{4^n}\cdot 4} = -\frac{4}{4} = -1$



d) $\lim\limits_{n\to\infty}\left(\sqrt{3n^2-2n} - \sqrt{3n^2-1}\right) =$ ($\infty - \infty$)

$\sqrt{3n^2-2n} = \sqrt{n^2(3-\frac{2}{n})}$, $\infty \cdot 3$

$\lim\limits_{n\to\infty} |n|\left(\sqrt{3-\frac{2}{n}} - \sqrt{3-\frac{1}{n^2}}\right) =$ ($\infty \cdot 0$)

$\frac{2}{(\sqrt{13}-\sqrt{2})} \cdot \frac{(\sqrt{13}+\sqrt{2})}{(\sqrt{13}+\sqrt{2})} = \frac{2(\sqrt{13}+\sqrt{2})}{11}$

$\lim \frac{\left(\sqrt{3n^2-2n} - \sqrt{3n^2-1}\right)}{1} \cdot \frac{\left(\sqrt{3n^2-2n}+\sqrt{3n^2-1}\right)}{\left(\sqrt{3n^2-2n}+\sqrt{3n^2-1}\right)} =$

$\lim\limits_{n\to+\infty} \frac{\cancel{3n^2}-2n-\cancel{3n^2}+1}{\sqrt{3n^2-2n}+\sqrt{3n^2-1}}$ st L = 1, st M = 1

$n = |n|$

$\lim\limits_{n\to\infty} \frac{\cancel{n}(-2+\frac{1}{n})}{\cancel{|n|}\left(\sqrt{3-\frac{2}{n}}+\sqrt{3-\frac{1}{n^2}}\right)} = \frac{-2}{\sqrt{3}+\sqrt{3}} = -\frac{1}{\sqrt{3}}$

$\lim\limits_{n\to\infty} \frac{\sqrt{n(n+2)}-n}{n+2-\sqrt{n(n+2)}}$ ($\frac{\infty-\infty}{\infty-\infty}$)

$\frac{(\sqrt{a}-\sqrt{b})(\sqrt{a}+\sqrt{b})}{(\sqrt{a}+\sqrt{b})} = \boxed{\frac{a-b}{\sqrt{a}+\sqrt{b}} = \sqrt{a}-\sqrt{b}}$

$\lim \frac{\left(\sqrt{n(n+2)}-n\right)}{\left(n+2-\sqrt{n(n+2)}\right)} \cdot \frac{\left(\sqrt{n(n+2)}+n\right)}{\sqrt{n(n+2)}+n} \cdot \frac{\left((n+2)+\sqrt{n(n+2)}\right)}{\left((n+2)+\sqrt{n(n+2)}\right)}$

$\lim\limits_{n\to\infty} \frac{\left(n(n+2)-n^2\right)\left((n+2)+\sqrt{n(n+2)}\right)}{\left((n+2)^2-n(n+2)\right)\left(\sqrt{n(n+2)}+n\right)} =$

$n^2+4n+4-n^2-2n$

$\lim \frac{2n\cdot\left((n+2)+\sqrt{n^2+2n}\right)}{(2n+4)\left(\sqrt{n^2+2n}+n\right)} =$ st L = 2, st M = 2

$\lim\limits_{n\to\infty} \frac{2\cancel{n}\cdot\cancel{n}\left(1+\frac{2}{n}+\sqrt{1+\frac{2}{n}}\right)}{\cancel{n}(2+\frac{4}{n})\cancel{n}\left(\sqrt{1+\frac{2}{n}}+1\right)} =$

$\frac{\cancel{2}\cdot(1+\sqrt{1})}{\cancel{2}(\sqrt{1}+1)} = 1$

$$\lim_{x\to-\infty}\frac{\sqrt{2-4x}-\sqrt{1-x}}{\sqrt{-x}}\cdot\frac{\sqrt{2-4x}+\sqrt{1-x}}{\sqrt{2-4x}+\sqrt{1-x}}=$$

$|x|=\overset{+}{\widetilde{-x}}$

$$\lim_{x\to-\infty}\frac{2-4x-1+x}{\sqrt{4x^2-2x}+\sqrt{x^2-x}}=\lim_{x\to-\infty}\frac{\overset{-1}{\cancel{x}}\left(-3+\frac{1}{x}\right)}{\underbrace{|x|}_{-\cancel{x}}\left(\sqrt{4-\frac{2}{x}}+\sqrt{1-\frac{1}{x}}\right)}=$$

$\to 0$

$$\frac{3}{\sqrt{4}+\sqrt{1}}=1$$

$2.23 \quad -2.28$