## №1.187

$$\lim_{n\to\infty}\left(\sqrt{(n+a)^2}-n\right)=\lim_{n\to\infty}\left(\left((n+a)^{2}\right)^{\frac{1}{2}}-n\right)=\lim_{n\to\infty}(n+a-n)=$$

$$=\lim_{n\to\infty}a=\boxed{a}$$

## №1.195

$$\lim_{n\to\infty}\sqrt[n]{n}=\lim_{n\to\infty}n^{\frac{1}{n}}=\boxed{0}$$

## №1.181

$$a_n=\frac{1}{n^2}\sum_{k=1}^{n}k(k+1)$$

$$\lim_{n\to\infty}\frac{1}{n^2}\sum_{k=1}^{n}k(k+1)=\infty$$

## №1.179

$$a_n=\sum_{k=1}^{n}\frac{k}{(2k-1)^2(2k+1)^2}$$

$$\lim_{n\to\infty}\frac{k}{(2k-1)^2(2k+2)^2}=\infty$$

## №1.177

$$a_n=\sum_{k=1}^{n}\frac{1}{(3k-1)(3k+2)}$$

$$\lim_{n\to\infty}\frac{1}{(3k-1)(3k+2)}=\infty$$

# Домашня робота

$\boxed{1}$ $\lim\limits_{n\to\infty} \dfrac{n^4+n+1}{1-2n^4} = \lim\limits_{n\to\infty} \dfrac{\frac{n^4}{n^4}+\frac{n}{n^4}+\frac{1}{n^4}}{\frac{1}{n^4}-\frac{2n^4}{n^4}} = \lim\limits_{n\to\infty} \dfrac{1+\overset{\to 0}{\frac{1}{n^3}}+\overset{\to 0}{\frac{1}{n^4}}}{\underset{0}{\frac{1}{n^4}}-2} =$

$= \boxed{-\dfrac{1}{2}}$

$\boxed{2}$ $\lim\limits_{n\to\infty} \dfrac{(n+3)^3-(n-3)^3}{(2n+3)^2} = \lim\limits_{n\to\infty} \dfrac{n^3+9n^2+27n+27-(n^3-9n^2+27n-27)}{(2n+3)^2} =$

$= \lim\limits_{n\to\infty} \dfrac{\cancel{n^3}+9n^2+\cancel{27n}+27-\cancel{n^3}+9n^2-\cancel{27n}+27}{4n^2+12n+9} = \lim\limits_{n\to\infty} \dfrac{18n^2+54}{4n^2+12n+9} =$

$= \lim\limits_{n\to\infty} \dfrac{18n^2+54}{4n^2+12n+9} = \dfrac{18}{4} = \boxed{\dfrac{9}{2}}$

$\boxed{3}$ $\lim\limits_{n\to\infty} \dfrac{7^{n+2}+4}{5^n+3\cdot 7^n} = \lim\limits_{n\to\infty} \dfrac{7^n\cdot 7^2+4}{5^n+3\cdot 7^n} =$

$= \lim\limits_{n\to\infty} \dfrac{\frac{\cancel{7^n}\cdot 7^2}{\cancel{7^n}}+\frac{4}{7^n}}{\frac{\cancel{7^n}\cdot 3}{\cancel{7^n}}+\frac{5^n}{7^n}} = \lim\limits_{n\to\infty} \dfrac{49+\overset{\to 0}{\frac{4}{7^n}}}{3+\underset{\to 0}{\left(\frac{5}{7}\right)^n}} = \dfrac{49}{3} = \boxed{16\dfrac{1}{3}}$

№1.183

$\lim\limits_{n\to\infty} \dfrac{n(n+2)-\sqrt{n^4+6n^3+1}}{n+5} = \boxed{0}$

№1.184

$\lim\limits_{n\to\infty} \left(\sqrt{n+a\sqrt{n}+1}-\sqrt{n}\right) = \boxed{1}$ $\left\{\lim\limits_{n\to\infty}\left((n^1+an^{\frac{1}{2}}+1)^{\frac{1}{2}}-n^{\frac{1}{2}}\right)\right\}$

№1.189

$\lim\limits_{n\to\infty} \sqrt[n^2]{n} = \lim\limits_{n\to\infty} n^{\overset{\to 0}{\frac{1}{n^2}}} = \boxed{1}$

№1.191

$\lim\limits_{n\to\infty} 2^{\frac{1}{\sqrt{n}}} = \lim\limits_{n\to\infty} 2^{\frac{1}{n^{\frac{1}{2}}}} = \boxed{\infty}$