$$\lim_{n\to 8} \frac{3^n-2^n}{3^{n-1}+2^n} = \frac{3^\infty-2^\infty}{3^{\infty-1}+2^\infty} = (*)$$

hw 01.01 №2

Найдем мах n. $3^n > 2^n$; $3^n > 3^{n-1} \Rightarrow 3^n$

$$=(*) \lim_{n\to\infty} \frac{\frac{3^n}{3^n}-\frac{2^n}{3^n}}{\frac{3^{n-1}}{3^n\cdot 3}+\frac{2^n}{3^n}} = \lim_{n\to\infty} \frac{1-\left(\frac{2}{3}\right)^n}{\frac{1}{3}+\left(\frac{2}{3}\right)^n} =$$

$\left(\frac{2}{3}\right)^n \to 0$

$$= \lim_{n\to\infty} \cancel{1-\left(\frac{2}{3}\right)} \; 1 : \frac{1}{3} = 3.$$

$3^n \to \infty$, $n\to\infty$

Ответ: 3.

$$\lim_{x\to\frac{5}{2}} \frac{2x^2-9x+10}{2x-5} = \lim_{x\to\frac{5}{2}} \frac{\left(x-\frac{5}{2}\right)(x-2)}{2\left(x-\frac{5}{2}\right)} =$$

hw 01.01 №3.

$$= \lim_{x\to\frac{5}{2}} \frac{x-2}{2} = \frac{1}{2}\left(\frac{5}{2}-2\right) = \frac{5}{4}-1 = \frac{1}{4}.$$

$2x^2-9x+10 = \left(x-\frac{5}{2}\right)(x-2)$

$D = b^2-4ac = (-9)^2-4\cdot 2\cdot 10 = 81-80 = 1$

$$x_{1,2} = \frac{-b\pm\sqrt{D}}{2a} = \frac{9\pm 1}{4} \quad \begin{matrix} \frac{10}{4} = \frac{5}{2} \\ \frac{8}{4} = 2 \end{matrix}$$

$$\lim_{n\to\infty} \frac{n-1}{3n} = \frac{\infty-1}{3\infty} = \left[\frac{\infty}{\infty}\right] =$$

$$= \lim_{n\to\infty} \frac{n}{3n} - \frac{1}{3n} = \frac{1}{3} - \underbrace{\frac{1}{3n}}_{0} = \frac{1}{3}$$

$$\lim_{n\to\infty} \frac{5n+1}{7-9n} = \left[\frac{\infty}{\infty}\right] = :n =$$

$$= \lim_{n\to\infty} \frac{\frac{5n}{n} + \frac{1}{n}}{\frac{7}{n} - \frac{9n}{n}} = \lim_{n\to\infty} \frac{5 + \overset{\to 0}{\frac{1}{n}}}{\underset{0}{\frac{7}{n}} - 9} = -\frac{5}{9}$$

$$\lim_{n\to\infty} \frac{(n+1)^2}{2n^3} = \left[\frac{\infty}{\infty}\right] = (*)$$

$$(a+b)^2 = a^2 + 2ab + b^2$$

$$=(*) \lim_{n\to\infty} \frac{n^2+2n+1}{2n^3} = (:n^3) =$$

$$= \lim_{n\to\infty} \frac{\frac{n^2}{n^3} + \frac{2n}{n^3} + \frac{1}{n^3}}{\frac{2n^3}{n^3}} = \frac{\overset{\to 0}{\frac{1}{n}} + \overset{\to 0}{\frac{2}{n^2}} + \overset{\to 0}{\frac{1}{n^3}}}{2} = 0$$

Ответ: неопред-сть вида $\frac{\infty}{\infty}$ равна 0.

$$\lim_{n\to\infty} \frac{3n^2-7n+1}{2-5n-6n^2} = \frac{\infty}{\infty} = \frac{3n^2}{-6n^2} = -\frac{1}{2}$$

$$\lim_{n\to\infty} \frac{(n+2)^3-(n-2)^3}{95n^3+39n}$$

$(a+b)^3 = a^3+3a^2b+3ab^2+b^2$

$(a-b)^3 = a^3-3a^2b+3ab^2-b^3 =$

$\sin 0 = 0$ $\quad$ $tg\, 0 = 0$

$\cos 0 = 1$

Ось синусов − OY.

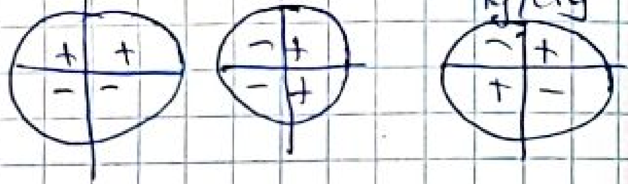
тригонометр. круг. Ось косинусов − OX

$tg = \frac{\sin}{\cos}$

$ctg = \frac{\cos}{\sin}$

Знаки триг. − ф-й

sin $\quad$ cos $\quad$ tg/ctg



1-й зам. предел

$$\lim_{x\to 0} \frac{\sin \alpha(x)}{\alpha(x)} = \left[\frac{0}{0}\right] = 1$$

$$\lim_{x\to 0} \frac{\alpha(x)}{\sin \alpha(x)} = \left[\frac{0}{0}\right] = 1$$

$$\lim_{x\to 0} \frac{\sin 3x}{3x} = \frac{\sin 3\cdot 0}{3\cdot 0} = \left[\frac{0}{0}\right] = 1$$

$$\lim_{x\to 0} \frac{\frac{5x}{3}}{\sin \frac{5x}{3}} = \left[\frac{0}{0}\right] = 1$$

$$\lim_{x\to 0} \frac{x^3 - 5x^2 + x}{\sin(x^3 - 5x + x)} = \frac{0^3 - 5\cdot 0^2 + 0}{\sin(0)} = \left[\frac{0}{0}\right] = 1$$

$$\lim_{x\to 0} \frac{\sin(x^2-3x+5)}{x^2-3x+5} + 1$$ при const.

$$\lim_{x\to 0} \frac{\sin 7\cdot x}{3x} = \lim$$

$$\lim_{n\to\infty} \frac{n\sqrt[3]{7n} - \sqrt[4]{81n^8-1}}{(n+4\sqrt{n})(\sqrt{n^2-5})} = \left[\frac{\infty-\infty}{\infty}\right] = (*)$$ вид а.а. №1.

Найдем мах. степень и ~~n^3~~ $n\sqrt[3]{n} = \sqrt[3]{n^3\cdot n} = n^{\frac{4}{3}}$, n^2;

n; $\sqrt{n}$; $\sqrt{n^2} = n$ $\Rightarrow n^2$. $|\Rightarrow$: на n^2.

$$= (*) \lim_{n\to\infty} \frac{\dfrac{n\sqrt[3]{7}\sqrt[3]{n}}{n^2} - \dfrac{\sqrt[4]{81n^8-1}}{n^2}}{\dfrac{(n+4\sqrt{n})(\sqrt{n^2-5})}{n^2}} =$$

$$= \lim_{n\to\infty} \frac{\sqrt[3]{7}\,\dfrac{\sqrt[3]{n^4}}{\sqrt[3]{n^6}} - \sqrt[4]{\dfrac{81n^8}{n^8} - \dfrac{1}{n^8}}}{\dfrac{(n+4\sqrt{n})}{n}\cdot\dfrac{(\sqrt{n^2-5})}{n}} =$$

$$= \lim_{n\to\infty} \frac{\sqrt[3]{7}\, n^{-\frac{2}{3}} - \sqrt[4]{81 - \frac{1}{n^8}}}{\left(\frac{n}{n} + \frac{4\sqrt{n}}{n}\right)\cdot\left(\sqrt{\frac{n^2}{n^2} - \frac{5}{n^2}}\right)} =$$

= x2415

= 00S200

$$= \lim_{n\to\infty} \frac{\sqrt[3]{7}\cdot\frac{1}{\sqrt[3]{n^2}} - \sqrt[4]{81 - \frac{1}{n^2}}}{\left(1+\frac{4}{\sqrt{n}}\right)\left(\sqrt{1-\frac{5}{n^2}}\right)} = \frac{-\sqrt[4]{3^4}}{1} = -3$$

Ответ: -3.

$$-\quad \lim_{n\to -2} \frac{\sqrt[3]{x-6}+2}{x+2} = \left[\frac{0}{0}\right] = (*) =$$

ш00.01

№5.

$$a^3+b^3=(a+b)(a^2-ab+b^2)$$

$$= \lim_{n\to -2} \frac{(\sqrt[3]{x-6}+2)\left((\sqrt[3]{x-6})^2 - 2\sqrt[3]{x-6}+2^2\right)}{(x+2)\left((\sqrt[3]{x-6})^2 - 2\sqrt[3]{x-6}+2^2\right)} =$$

$$= \lim_{n\to -2} \frac{(\sqrt[3]{x-6})^3+2^3}{(x+2)\ \text{п-и}} = \lim_{x\to -2} \frac{x-6+8}{(x+2)\ \text{п-и}} = \cancel{\lim_{x\to -2} \frac{-2-6+8}{(x+2)(\text{п-и})}} = \frac{0}{0}$$

$$= \lim_{n\to -2} \frac{x+2}{(x+2)\left((\sqrt[3]{x-6})^2 - 2\sqrt[3]{x-6}+4\right)} = \lim_{x\to -2} \frac{1}{(\sqrt[3]{x-6})^2 - 2\sqrt[3]{x-6}+4} =$$

$$= \frac{1}{(\sqrt[3]{-2-6})^2 - 2\sqrt[3]{-2-6}+4} = \frac{1}{(\sqrt[3]{-8})^2 - 2\sqrt[3]{-8}+4} = \frac{1}{(\sqrt[3]{(-2)^3})^2 - 2\sqrt[3]{(-2)^3}+4}$$

$$= \frac{1}{(-2)^2 - 2\cdot(-2)+4} = \frac{1}{4+4+4} = \frac{1}{12}$$

Демидович

5.231

$$\lim_{n\to\infty} \frac{n-1}{3n} = \left[\frac{\infty}{\infty}\right] = \lim_{n\to\infty} \frac{\frac{n}{n} - \frac{1}{n}^{\to 0}}{\frac{3n}{n}} = \frac{1}{3}$$

5.232.

$$\lim_{n\to\infty} \frac{5n+1}{7-9n} = \lim_{n\to\infty} \frac{\frac{5n}{n}}{\frac{-9n}{n}} = -\frac{5}{9}$$

5.233.

$$\lim_{n\to\infty} \frac{(n+1)^2}{2n^3} = \left[\frac{\infty}{\infty}\right] = \frac{\frac{n^2}{n^3}^{\to 0} + \frac{2n}{n^3}^{\to 0} + \frac{1}{n^3}^{\to 0}}{\frac{2n^3}{n^3}} = \frac{0}{2} = 0$$

5.234

$$\lim_{n\to\infty} \frac{3n^2-7n+1}{2-5n-6n^2} = \frac{\frac{3n^2}{n^2}}{\frac{-6n^2}{n^2}} = \lim_{n\to\infty} -\frac{1}{2}$$

5.235

$$\lim_{n\to\infty} \frac{(n+2)^3-(n-2)^3}{95n^3+39n} = \left[\frac{\infty-\infty}{\infty+\infty}\right] =$$

$$= \lim_{n\to\infty} \frac{n^3+3n^2\cdot 2+3\cdot 2^2 n+2^3-(n^3-3\cdot 2n^2+3\cdot 2^2 n-2^3)}{\text{II}-\text{II}} =$$

$$= \lim_{n\to\infty} \frac{\cancel{n^3}+6n^2+\cancel{12n}+8-\cancel{n^3}+6n^2-\cancel{12n}+8}{\text{II}-\text{II}} =$$

$$= \lim_{n\to\infty} \frac{12n^2+16}{n(95n^2+39)} = \left|:n^3\right| = \frac{\frac{12n^2}{n^3}^{\to 0}+\frac{16}{n^3}^{\to 0}}{\frac{95n^3}{}\ \frac{39n}{}} = 0$$