№ 64.21

29.04

$$\lim_{x \to -1/2} \frac{2x^2 - x - 1}{-6x^2 + 5x + 4} = \left[\frac{0}{0}\right] =$$

$$= \lim_{x \to -1/2} \frac{2(x+1)(x+\frac{1}{2})}{-6(x-4/3)(x+\frac{1}{2})} = \frac{x-1}{-3\cdot(x-4/3)} =$$

$$= \frac{-\frac{1}{2} - 1}{+\frac{3}{2} + 4} = -\frac{3}{2} : \frac{11}{2} = -\frac{3}{2} \cdot \frac{2}{11} = -\frac{3}{11}$$

№ 64-23

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

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

$$= \lim_{x \to 1} \frac{x^2+3}{2x^2+1} = \frac{4}{3} = 1\frac{1}{3}$$

№ 6.4.24

$$\lim_{x\to -6} \frac{x^2+7x+6}{x^3+6x^2+3x+18} = \frac{x^2+7x+6}{x^2(x+6)+3(x+6)} =$$

$$= \frac{(x+1)(x+6)}{(x^2+3)(x+6)} = \lim_{x\to -6} \frac{x+1}{(x^2+3)} = \frac{-5}{+39} = -\frac{5}{39}$$

№ 6.4.25

$$\lim_{x\to 0} \frac{\sqrt{x+25}-5}{x^2+2x} = \left[\frac{0}{0}\right] = \quad /\cdot \sqrt{x+25}+5$$

$$= \frac{(x+25)-(25)}{x(x+2)\cdot(\sqrt{x+25}+5)} = \frac{x}{x\cdot(x+2)\cdot(\sqrt{x+25}+5)} =$$

$$= \frac{1}{(0+2)(5+5)} = \frac{1}{20}$$

№ 6.4.26

$$\lim_{x\to 2} \frac{x^2-2x}{\sqrt{x^2+6x}-4} = \left[\frac{0}{0}\right]$$

$$\lim_{x\to 2} \frac{x(x-2)(\sqrt{x^2+6x}+4)}{x^2+6x-16}$$

$$\lim_{x\to 2} \frac{x(x-2)(\sqrt{x^2+6x}+4)}{(x-2)(x+8)} = \frac{2\cdot(\sqrt{4+12}+4)}{10} =$$

$$\frac{-7\pm\sqrt{49-24}}{2} = \frac{-7\pm 5}{2} \quad x_1=-1 \quad x_2=-6$$

$$\frac{-6\pm\sqrt{36+64}}{2} = \frac{-6\pm 10}{2}$$

$$= \frac{2\cdot(4+4)}{10} = \frac{16}{10} = 1{,}6$$

№ 6.4.27

$$\lim_{x\to 3} \frac{\sqrt{2x+3}-3}{\sqrt{x-2}-1} = \left[\frac{0}{0}\right] =$$

$$= \frac{(\sqrt{2x+3}-3)(\sqrt{2x+3}+3)(\sqrt{x-2}+1)}{(\sqrt{x-2}-1)(\sqrt{x-2}+1)(\sqrt{2x+3}+3)} =$$

$$= \frac{(2x+3-9)(\sqrt{x-2}+1)}{(x-2-1)(\sqrt{2x+3}+3)} = \frac{(2x-6)(\sqrt{x-2}+1)}{(x-3)(\sqrt{2x+3}+3)} =$$

$$= \frac{2(x-3)(\sqrt{x-2}+1)}{(x-3)(\sqrt{2x+3}+3)} = \frac{2\cdot(1+1)}{3+3} = \frac{4}{6} = \frac{2}{3}$$

№ 6.4.28

$$\lim_{x\to 1} \frac{\sqrt{2-x}-1}{\sqrt{5-x}-2}$$ — Аналогично 6.4.27

№ 6.4.29

$$\lim_{x\to 0} \frac{\sqrt[3]{8-x}-2}{x} = \left[\frac{0}{0}\right]$$

$$a^3 \pm b^3 = (a\pm b)\cdot(a^2 \mp ab + b^2)$$

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

$$\lim_{x\to0}\frac{(\sqrt[3]{8-x}-2)((\sqrt[3]{8-x})^2+\sqrt[3]{8-x}\cdot2+2^2)}{x\cdot((\sqrt[3]{8-x})^2+\sqrt[3]{8-x}\cdot2+2^2)}=$$

$$=\lim_{x\to0}\frac{(\sqrt[3]{8-x})^3-2^3}{x\cdot(\sqrt[3]{(8-x)^2}+2\cdot\sqrt[3]{8-x}+2^2)}=$$

$$=\lim_{x\to0}\frac{-1}{\sqrt[3]{(8-x)^2}+2\cdot\sqrt[3]{8-0}+4}=\frac{1}{\sqrt[3]{64}+2\sqrt[3]{8+}}$$

$$=\frac{-1}{4+2\cdot2+4}=-\frac{1}{12}$$

№ 6.430

$$\lim_{x\to4}\frac{x^2-16}{\sqrt[3]{5-x}-\sqrt[3]{x-3}} \Big/ \cdot\left((\sqrt[3]{5-x})^2+(\sqrt[3]{5-x}\cdot\sqrt[3]{x-3})+(\sqrt[3]{x-3})^2\right)$$

$$\lim_{x\to4}\frac{(x+4)(x-4)\cdot\left(\sqrt[3]{5-x}^{\,2}+(\sqrt[3]{5-x}\cdot\sqrt[3]{x-3})+\sqrt[3]{x-3}^{\,2}\right)}{5-x-x+3}=$$

$$=\frac{(x+4)(x-4)\cdot\left(\sqrt[3]{5-x}^{\,2}+(\sqrt[3]{5-x}\cdot\sqrt[3]{x-3})+\sqrt[3]{x-3}^{\,2}\right)}{-2x+8}=$$

$$\lim_{x\to4}\frac{(x+4)\cdot\left(\sqrt[3]{5-x}^{\,2}+(\sqrt[3]{5-x}\cdot\sqrt[3]{x-3})+\sqrt[3]{x-3}^{\,2}\right)}{-2}$$

$$=\frac{(4+4)\cdot\left(\sqrt[3]{5-4}^{\,2}+(\sqrt[3]{5-4}\cdot\sqrt[3]{4-3})+\sqrt[3]{4-3}^{\,2}\right)}{-2}=$$

$$=\frac{8\cdot(1+1+1)}{-2}=-4\cdot3=-12$$

Черновик 6431 - 6436