به نام خدا

لویا نظلیان

DATE / / SUBJECT:

① $\lim\limits_{x\to 2}\dfrac{2x-5}{x^2+ax+b}=-\infty \rightarrow x^2+ax+b=(x-2)^2=x^2-4x+4 \rightarrow a=-4,\ b=4 \rightarrow$

$a+b=0$

② $\lim\limits_{x\to(\sqrt[3]{4})}\dfrac{x}{x^2+ax+b}=+\infty \rightarrow x^2+ax+b=(x-\sqrt[3]{4})^2=x^2-2\sqrt[3]{4}x+\sqrt[3]{16}$

$\rightarrow \left[\dfrac{b}{a}\right]=\left[\dfrac{\sqrt[3]{16}}{-2\sqrt[3]{4}}\right]=\left[\dfrac{\sqrt[3]{4}}{-2}\right]=\left[-2^{-\frac{1}{3}}\right]=\boxed{-1}$

③ $\lim\limits_{x\to(\frac{1}{\sqrt{2}})^+}\dfrac{[-x]+a}{\left|\frac{1}{\sqrt{2}}x+a\right|+a}=-\infty \rightarrow \lim\dfrac{a-1}{\left|a+\frac{1}{2}\right|+a}=-\infty \rightarrow \dfrac{a-1}{2a+\frac{1}{2}}=-\infty$

$\rightarrow a=\dfrac{-1}{4} \rightarrow [a]=-1$

④ $x>\dfrac{-1}{2} \rightarrow x^2<\dfrac{1}{4} \rightarrow \dfrac{1}{x^2}>4 \rightarrow \dfrac{-2}{x^2}<-8 \rightarrow \left[\dfrac{-2}{x^2}\right]=-9$

$x>\dfrac{-1}{2} \rightarrow x^2<\dfrac{1}{4} \rightarrow \dfrac{1}{x^2}>4 \rightarrow \dfrac{3}{x^2}>12 \rightarrow \left[\dfrac{3}{x^2}\right]=12$

$\lim\limits_{x\to(\frac{-1}{2})^+}\dfrac{16x-\left[\frac{-2}{x^2}\right]}{24x+\left[\frac{3}{x^2}\right]}=\dfrac{16x+9}{24x+12}=\dfrac{1}{0^+}=\boxed{+\infty}$

⑤ $\lim\limits_{x\to 2}\dfrac{x^2-4}{x^3-8}=\dfrac{(x-2)(x+2)}{(x-2)(x^2+2x+4)}=\dfrac{x+2}{x^2+2x+4}=\dfrac{4}{12}=\dfrac{1}{3}$

⑥ $\lim\limits_{x\to -8}\dfrac{x^2+10x+16}{12+6\sqrt[3]{x}}=\dfrac{(x+2)(x+8)}{12+6\sqrt[3]{x}}=\dfrac{0}{0}\xrightarrow{HOP}\dfrac{2x+10}{\frac{6}{3\sqrt[3]{x^2}}}=\dfrac{\sqrt[3]{x^2}(2x+10)}{2}=$

$\dfrac{(4)(-6)}{2}=\boxed{-12}$

Sahand

پویا نافلیان

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$$\lim_{x\to 0}\frac{\sqrt{2+4x}-\sqrt{2-x}}{\sqrt{1-\cos x}}=\frac{4x}{(\sqrt{1-\cos x})(2\sqrt{2})}=\frac{4x(\sqrt{2})}{-\sin x(2\sqrt{2})}=\frac{-4}{2}=\boxed{-2}$$ (7)

$$\lim_{x\to 0}\frac{k+\cos(\sqrt{a}\,x)}{kx^2}=3$$ → مخرج ۰ ← اما ← صورت ۰ → (8)

حاصل حد عدد است

$$k+1=0\to k=-1\to \lim_{x\to 0}\frac{\cos(\sqrt{a}\,x)-1}{-x^2}=3\to\frac{0}{0}\to \text{Hop}\to$$

$$\frac{-\sin(\sqrt{a}\,x)\times\sqrt{a}}{-2x}=3\to\frac{-\sqrt{a}\,x\times\sqrt{a}}{-2x}=3\to$$

$$\frac{a}{2}=3\to\boxed{a=6}\to\frac{a}{k}=\boxed{-6}$$

$$\lim_{x\to(3a)^+}\frac{2\sqrt{x-3a}+2\sqrt{x}-\sqrt{12a}}{\sqrt{x^2-9a^2}}=\frac{\frac{1}{2\sqrt{x-3a}}+\frac{3}{2\sqrt{x}}}{\frac{2x}{2\sqrt{x^2-9a^2}}}=\frac{\frac{2\sqrt{x}+6\sqrt{x-3a}}{(2\sqrt{x})(2\sqrt{x-3a})}}{\frac{x}{(\cancel{\sqrt{x-3a}})(\sqrt{x+3a})}}=\frac{2\sqrt{3a}}{2x\times 2\sqrt{3a}}\times\sqrt{6a}$$ (9)

$$=\frac{\sqrt{6a}}{3a}=\frac{\sqrt{6}}{3\sqrt{a}}$$

$$x\to(-1)^+\to\frac{1+k}{\underbrace{x^2-1}_{0^-}}=-\infty\to 0<k+1\to -1<k$$ (10)

$$\begin{array}{ccc} & -1 & 1 \\ + & | - | & + \end{array}$$

$$x\to(-1)^-\to\frac{1+2k}{\underbrace{x^2-1}_{0^+}}=-\infty\to 1+2k<0\to k<\frac{-1}{2}$$

$$\to -1<k<\frac{-1}{2}$$

$$\to -\pi<k\pi<\frac{-\pi}{2}\to -1<\cos k\pi<0\to$$ $\boxed{\text{نامعلوم}}$

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