پریا ایرانی

1)

$$\lim_{x\to 2}\frac{2x-5}{x^2+ax+b}=-\infty \to \frac{-1}{4+2a+b}=-\infty \to 4+2a+b=0 \to 2a+b=-4$$

$$x^2+ax+b=(x+\frac{a}{2})^2=(x-2)^2=x^2-4x+4 \to a=-4,\ b=4 \quad a+b=(-4)+4=0$$

2)

$$\lim_{x\to\sqrt[3]{4}}\frac{x}{x^2+ax+b}=+\infty \to \frac{\sqrt[3]{4}}{\sqrt[3]{16}+a\sqrt[3]{4}+b}=-\infty \to \sqrt[3]{4}\,a+b+\sqrt[3]{16}=0$$

$$\to \sqrt[3]{4}\,a+b=-\sqrt[3]{16} \qquad x^2+ax+b=(x+\frac{a}{2})^2=(x-\sqrt[3]{4})^2=x^2-2\sqrt[3]{4}x$$

$$+\sqrt[3]{16} \to a=-2\sqrt[3]{4} \qquad b=\sqrt[3]{16} \qquad [\frac{b}{a}]=-1$$

3)

$$\lim_{x\to\frac{1}{\sqrt{2}}}\frac{[-x]+a}{|\frac{\sqrt{2}}{2}x|+a}=-\infty \to \frac{a-1}{|\frac{1}{2}+a|+a}=-\infty \to |a+\frac{1}{2}|+a=0$$

$$\to a\geqslant\frac{1}{2} \to 2a+\frac{1}{2}=0 \to \frac{-\frac{5}{4}}{0}=-\infty$$

$$a<\frac{1}{2} \to -a-\frac{1}{2}-a=0 \to -\frac{1}{2} \times \qquad a=-\frac{1}{4} \to [-\frac{1}{4}]=-1$$

4)

$$\lim\frac{16x-[-\frac{2}{x^2}]}{24x+[\frac{2}{x^2}]} \to \lim_{x\to(-\frac{1}{2})^+}\frac{16x+9}{24x+12} \to \frac{1}{0^+}=+\infty$$

5)

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

6)

$$\lim\frac{x^2+10x+16}{2+\sqrt[3]{x}}=\frac{(x+8)(x+2)}{6(2+\sqrt[3]{x})}=\frac{(\sqrt[3]{x}+2)(\sqrt[3]{x^2}-2\sqrt[3]{x}+4)(x+2)}{6(2+\sqrt[3]{x})}$$

$$=\frac{12\times(-6)}{6}=-12$$

7)

$$\lim\frac{\sqrt{2+3x}-\sqrt{2-x}}{\sqrt{1-5x}} \to \frac{\sqrt{2+3x}+\sqrt{2+x}}{\sqrt{2+3x}+\sqrt{2+x}}=\frac{2+3x-2+x}{\frac{\sqrt{x^2}}{2}\times2\sqrt{2}} \to$$

$$\frac{4x}{|x|-2}=-2 \Rightarrow \frac{x^2}{2}$$

9)

$$\lim \frac{3\sqrt{x-3a}+3\sqrt{x}-\sqrt{27x}}{\sqrt{x^2-9a^2}}=\frac{0}{0}\rightarrow \lim \frac{3}{\sqrt{x+3a}}+\frac{3\sqrt{x}-3\sqrt{3a}}{\sqrt{x^2-9a^2}}$$

$$=\frac{3}{\sqrt{6a}}+\frac{3(x-3a)}{\sqrt{x+3a}\sqrt{x-3a}\cdot 3\sqrt{3a}}=?\qquad \frac{3}{\sqrt{6}\,a}$$

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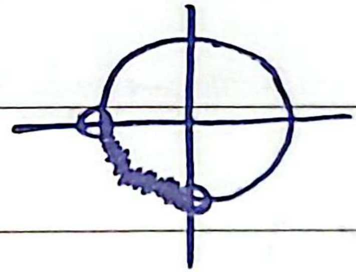
$$\lim_{x\to -1}\frac{1-k[x]}{x^2-1}\begin{cases} + \rightarrow \dfrac{1+k}{x^2-1}=\dfrac{1+k}{0^-}=-\infty \\ - \rightarrow \dfrac{1+2k}{x^2-1}=\dfrac{1+2k}{0^+}=+\infty \end{cases}$$

$$\rightarrow 1+k>0 \rightarrow k>-1$$

$$\rightarrow 1+2k<0 \rightarrow k<-\frac{1}{2}$$

$$-1<k<-\frac{1}{2}\begin{cases} -\pi<k\pi<-\frac{\pi}{2} \\ -1<\cos k\pi<0 \end{cases}$$



ناحیه ۳