-۱

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

$$(x-2)^2=0$$

$$x^2-4x+4 = x^2+ax+b$$

$$a=-4,\quad b=4 \rightarrow a+b=0$$

$\longrightarrow$ صورت $\rightarrow 2(2)-5=-1$

که چون جواب کل $-\infty$ شده پس حاصل عبارت 0^+ است

-۲

$$\lim_{x\to (\sqrt[3]{4})} \frac{\overset{\text{مثبت}}{x}}{x^2+ax+b} = +\infty$$

$$\rightarrow x^2+ax+b=0 \rightarrow (x-\sqrt[3]{4})^2$$

$$x^2+\sqrt[3]{16}-2x\sqrt[3]{4} = x^2+ax+b$$

$$a=-2\sqrt[3]{4},\quad b \rightarrow \sqrt[3]{16}$$

و از طرفی ۰ است.

$$\left[\frac{b}{a}\right] = \left[\frac{\sqrt[3]{16}}{-2\sqrt[3]{4}}\right] = \left[\frac{\cancel{2}\sqrt[3]{2}}{-\cancel{2}\sqrt[3]{4}}\right] = \left[\frac{-\sqrt[3]{2}}{\sqrt[3]{4}}\right] = -1$$

۳

$$\lim_{x\to\left(\frac{1}{\sqrt{3}}\right)^+} \frac{[-x]+a}{\left|\frac{\sqrt{3}}{3}x+a\right|+a} = -\infty \qquad \left[-\frac{1}{\sqrt{3}}\right] = -1$$

$$x=\frac{1}{\sqrt{3}} \rightarrow \frac{\sqrt{3}}{3}x = \frac{\cancel{\sqrt{3}}}{3}\times\frac{1}{\cancel{\sqrt{3}}} = \frac{1}{3}$$

$$\lim \frac{-1+a}{\left|\frac{1}{3}^+ + a\right| + a} = -\infty$$

$$\frac{[-x]+a}{\left|\frac{1}{3}+a\right|+a} = -\infty \qquad [a] = \left[-\frac{1}{6}\right] = -1$$

$$\frac{a-1}{\frac{1}{3}+2a} = -\infty$$

$$\frac{1}{3}+2a=0 \qquad 2a=-\frac{1}{3} \qquad \boxed{a=-\frac{1}{6}}$$

$$\frac{1}{3}+a=0 \qquad a=-\frac{1}{3}$$

$$\frac{a-1}{\frac{1}{3}+2a} \qquad \frac{a-1}{-\frac{1}{3}+\frac{1}{3}} \leftarrow$$ نمی‌تواند بشود

۴

$$\lim_{x\to\left(-\frac{1}{2}\right)^+} \frac{16x-\left[-\frac{2}{x^2}\right]}{24x+\left[\frac{3}{x^2}\right]} = \frac{16x+9}{24x+12}$$

$$\frac{-8+9}{-12^+ + 12} = \frac{+1}{0^+} = +\infty$$

$$x > -\frac{1}{2}$$

$$x^2 < \frac{1}{4}$$

$$\frac{1}{x^2} > 4 \rightarrow \frac{3}{x^2} > 12 \qquad \left[-\frac{2}{x^2}\right] = -9$$

$$\frac{2}{x^2} > 8$$

$$-\frac{2}{x^2} < -8$$

۵

$$\lim_{x\to 2^+} \frac{x^2-4}{x^3-8} = \frac{(x-2)(x+2)}{(x-2)(x^2+4+2x)} \qquad x>2,\ x^3>8,\ [x^3]=8$$

$$= \frac{4}{12} = \frac{1}{3}$$

۶-

$$\lim_{x\to -8}\frac{x^2+10x+16}{12+6\sqrt[3]{x}}=\frac{(x+8)(x+2)}{6(2+\sqrt[3]{x})}=\frac{(\cancel{x+8})(\sqrt[3]{x}+2)(\sqrt[3]{x^2}+4-2\sqrt[3]{x})}{6(\cancel{\sqrt[3]{x}+2})}$$

$$=-1(12)=-12$$

۷-

$$\lim_{x\to 0^-}\frac{\sqrt{2+3x}-\sqrt{2-x}}{\sqrt{1-\cos x}}\times\frac{\sqrt{2+3x}+\sqrt{2-x}}{\sqrt{2+3x}+\sqrt{2-x}}=\frac{2+3x-(2-x)}{\sqrt{2+3x}+\sqrt{2-x}}\times\frac{-\sin\frac{x}{2}}{-\sin\frac{x}{2}}=\frac{4x}{2\sqrt{2}\left(-\sin\frac{x}{2}\right)}$$

$\sqrt{1-\cos x}$: $-\sin\frac{x}{2}$

$$=-\frac{4}{\sqrt{2}}\times\frac{\sqrt{2}}{\sqrt{2}}=-2\sqrt{2}$$

با توجه به رابطه هم ارزی $\sin\alpha \to \alpha$

$$\sin^2\frac{x}{2}=\frac{1-\cos x}{2}$$

۸-

$$\frac{k+\cos(\sqrt{a}\,x)}{kx^2}=\frac{0}{0}\xrightarrow[\text{Hop}]{\text{ابتدا}}\frac{\sqrt{a}(-\sin x)}{2kx}\overset{\text{Hop}}{\Longrightarrow}$$

بهتر است از راه هم ارزی بریم چون ۲ بار Hop میشه

$k+\cos(0)=0$

$k=-1$

$\to \frac{a}{\ }=-\frac{1}{4}$

$\sin^2\alpha \to \alpha$

$\cos\alpha \to 1-\frac{\alpha^2}{2}$

$k+1-a x^2$ … $k+1=a x^2$

لیم ... [illegible] ... برابر

بریم چون Hop بازهم صفر شد

$K=-1$

$a = -4 \rightarrow \frac{a}{K} = -4$

$$\frac{K + 1 - \frac{a x^2}{2}}{K x^2} = 3$$

$\sin^4 \alpha \sim \alpha$

$\cos \alpha \rightarrow 1 - \frac{\alpha^2}{2}$

$$\frac{\cancel{K}^{-1} + 1 - \frac{a x^2}{2}}{-x^2} = 3 \rightarrow a = 6$$

$$\frac{2\sqrt{x-3a} + 3\sqrt{x} - 3\sqrt{3a}}{\sqrt{x^2-9a^2}} \overset{0}{\underset{0}{=}} \frac{\cancel{\quad}}{\sqrt{x-3a}\,\sqrt{x+3a}} = \frac{2\sqrt{x-3a} + \overbrace{3\sqrt{x} - 3\sqrt{3a}}^{3(\sqrt{x}-\sqrt{3a})}}{\sqrt{x-3a} \times \sqrt{x+3a}}$$

$$= \frac{2}{\sqrt{x+3a}} + \frac{3\overset{0}{(\sqrt{x}-\sqrt{3a})}}{\sqrt{x+3a}} = \frac{2}{\sqrt{6a}}$$

$$\frac{2}{\sqrt{6a}} \times \frac{\sqrt{6a}}{\sqrt{6a}} = \frac{2\sqrt{6a}}{6a} = \frac{\sqrt{6a}}{3a} = \frac{\sqrt{2}\times\sqrt{3}\times\sqrt{a}}{\sqrt{3}\times\sqrt{3}\times\sqrt{a}\times\sqrt{a}} = \frac{\sqrt{2}}{\sqrt{3a}}$$

$\frac{2}{a} = 27$

$$\lim_{x\to(-1)} \frac{1 - K[x]}{x^2-1} = -\infty$$

$(K\pi, \cos K\pi)$ نقاط مستر [illegible]

$x < 0 \quad y < 0$

$\longrightarrow x \rightarrow (-1)^+$

$x^2 - 1 < 0 \rightarrow 1 - K[x]^{-1} > 0$

$1 + K > 0$

$K > -1$

$\longrightarrow x \rightarrow (-1)^-$

$x^2 - 1 > 0$

$1 - K[x]^{-2} < 0$

$1 + 2K < 0$

$2K < -1$

$K < -\frac{1}{2}$

$-1 < K < -\frac{1}{2}$

$-2 < Ke < -\frac{e}{2}$