۱ —

$x \to -2^+ \Rightarrow 2\left[\frac{-5}{2}\right] + a\left[\frac{0^+}{2}\right] = -5 + a$

$x \to -2^- \Rightarrow 2\left[\frac{-5^+}{2}\right] + a\left[\frac{0^-}{2}\right] = -6 - a$

$\to -5 + a = -6 - a \to a = -1$

$\to \left[\frac{a}{2}\right] = \left[-\frac{1}{2}\right] = -1$

۲ —

$\lim_{x \to (\frac{\pi}{6})^-} [2\sin x - 1] = [1^- - 1] = [0^-] = -1$

$\lim_{x \to (\frac{\pi}{6})^-} \sin x = \frac{1^-}{2}$

۳ —

$\lim_{x \to -\frac{1}{2}} [8x^3 - x] = [-1 + \frac{1}{2}] = [-\frac{1}{2}] = -1$

$\lim_{x \to -\frac{1}{2}} 8x^3 = -1$

۴ —

$\lim_{x \to -\frac{1}{2}^-} \frac{10x - 3 + [\frac{3}{x^2}]}{12x - [-\frac{2}{x^2}]} = \frac{10x - 3 + 11}{12x + 8} = \frac{10x + 8}{12x + 8} = \frac{1}{0^-} = -\infty$

$x \to -\frac{1}{2}^-$

$\frac{3}{x^2}$ — $-\frac{1}{2}$

$-\frac{2}{x^2}$ — $-\frac{1}{2}$

۵ —

$\lim_{x \to 1^+} \frac{\sin^2 \pi x}{1 + \cos \pi x} = \frac{(1 - \cos \pi x)(1 + \cos \pi x)}{(1 + \cos \pi x)} = 1 - \cos 2\pi x = 1 + 1 = 2$

$[1^+] = 1$

۶ —

$\frac{\frac{2}{2\sqrt{2x+3}} - \frac{3}{2\sqrt{3x+4}}}{\frac{1}{3\sqrt{x}}} = \frac{1 - \frac{3}{2}}{\frac{1}{3}} = \frac{-\frac{1}{2}}{\frac{1}{3}} = -\frac{3}{2}$

$$\lim_{x\to 1} \frac{2x-\sqrt{x}+0}{2x-\sqrt{2x+1}} \to \frac{2-\frac{1}{2\sqrt{x}}}{2-\frac{2}{2\sqrt{2x+1}}} = \frac{2-\frac{1}{2}}{2-\frac{2}{4}} = \frac{-\frac{2}{4}}{\frac{6}{4}} = -\frac{1}{3}$$

$$a+\sqrt{bx+c}=0 \to a=-c^2$$

$$\text{H.P} \neq \frac{\frac{b}{2\sqrt{bx+c}}}{1} = \frac{1}{4} \to \frac{b}{2\sqrt{c}} = \frac{1}{4} \to 4b^2=c$$

$$a=-2b$$

$$-\frac{2b\times b}{4b^2} = -\frac{1}{2}$$

$$x\to -2\pi \to \begin{cases} -2\pi^+ \to \frac{4+2\pi-2k}{0^+} = +\infty \\ -2\pi^- \to \frac{4-2k}{0^-} = +\infty \end{cases}$$

$$4-2k>0 \to k<2$$

$$k<\frac{4}{2}$$

$$4-2k<0 \to [-k]=-2$$

$$\lim_{x\to 1} \frac{b\sqrt{4+\sqrt[3]{x^2}}-2b}{ax-b} \to \text{مبهم} \to 1a-b=0 \to b=1a$$

$$\text{H.P} \to \frac{\frac{b}{2\sqrt[3]{x^2}}}{\frac{2\sqrt{4+\sqrt[3]{x}}}{a}} = \frac{\frac{b}{2\sqrt[3]{8}}}{\frac{4}{a}} = \frac{b}{8a} = \frac{1a}{8a} = \frac{1}{8}$$