(۱ $f(x)=2\left[\frac{2-x}{2}\right]+a\left[\frac{x+2}{3}\right]$ $\quad 2+0=2$

حد در $x=-2$ موجود $\begin{cases} x\to -2^{+} \\ x\to -2^{-} \end{cases} \Rightarrow 4-2a=2 \quad a=1 \qquad \left[\frac{2}{3}\right]=0$

(۲

$\lim_{x\to \frac{\pi}{4}^-}\left[2\sin x-1\right] \to \left[1^- -1\right]=\left[0^-\right]=-1$

$x<\frac{\pi}{4} \to \sin x<\sin\frac{\pi}{4} \quad 2\sin x<2\sin\frac{\pi}{4}$ $(=1)$

(۳ $\lim_{x\to -\frac{1}{2}}\left[8x^3-x\right]=\left[-1+\frac{1}{2}\right]=\left[-\frac{1}{2}\right]=-1$

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$\lim_{x\to (-\frac{1}{2})^-}\frac{10x-5+\left[\frac{3}{x^2}\right]}{16x-\left[-\frac{2}{x^2}\right]}=\frac{10x-5+11}{16x-8}=\frac{10x+6}{16x+8}=\frac{-5+6}{-8^-+8}=\frac{1}{0^-}=-\infty$

$\hookrightarrow x<-\frac{1}{2} \quad x^2>\frac{1}{4} \quad \frac{1}{x^2}<4 \to \frac{-2}{x^2}>-8$

$\frac{3}{x^2}<12$

(۵

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

(۶ $\lim_{x\to -1}\frac{\sqrt{2x+3}-\sqrt{3x+4}}{1+\sqrt[3]{x}} \xrightarrow{HOP} \frac{\frac{2}{2\sqrt{2x+3}}-\frac{3}{2\sqrt{3x+4}}}{\frac{1}{3\sqrt[3]{x^2}}}=\frac{1-\frac{3}{2}}{\frac{1}{3}}=-\frac{3}{2}$ $\left(\frac{-1}{2}\right)$

(۷ $\lim_{x\to 1}\frac{2x-7\sqrt{x}+5}{2x-\sqrt{3x+1}} \xrightarrow{HOP} \frac{2-\frac{7}{2\sqrt{x}}}{2-\frac{3}{2\sqrt{3x+1}}}=\frac{2-\frac{7}{2}}{2-\frac{3}{4}}=\frac{-\frac{3}{2}}{\frac{5}{4}}=\frac{-12}{10}$

(۸ $\lim_{x\to 0}\frac{a+\sqrt{bx+c}}{x}=\frac{1}{4} \xrightarrow{HOP} \frac{\frac{b}{2\sqrt{bx+c}}}{1}=\frac{b}{2\sqrt{c}}=\frac{1}{4} \to 2\sqrt{c}=4b$

$\frac{0}{0}$ $\qquad b=\frac{\sqrt{c}}{2}$

$a+\sqrt{c}=0 \quad a=-\sqrt{c} \qquad \frac{-\sqrt{c}\times\frac{\sqrt{c}}{2}}{c}=\frac{\frac{-c}{2}}{c}=\frac{-1}{2}$

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$\lim_{x \to -2k} \frac{4 + k\left[\frac{x}{2k}\right]}{\sin x} = +\infty$ $\quad x \to -2k^+ \Rightarrow \frac{4 - 2k}{0^+} = +\infty$ $\quad 4 - 2k > 0 \quad 4 > 2k \quad k < 2$ (9

$\left[-k\right] = -2$

$x \to -2k^- \Rightarrow \frac{\epsilon - 2k}{0^-} = +\infty$ $\quad \epsilon - 2k < 0 \quad 2k > \epsilon \quad k > \frac{\epsilon}{2}$

$\lim_{x \to 1} \frac{b\sqrt{2 + \sqrt[3]{x}} - 2b}{ax - b} \overset{\text{H.O.P}}{\Rightarrow} \frac{\frac{\cancel{b}^{1}}{2\sqrt{2 + \sqrt[3]{x}}} \times \frac{1}{3\sqrt[3]{x^2}}}{\cancel{a}} = \frac{1}{2\sqrt{2 + \sqrt[3]{x}} \times 3\sqrt[3]{x^2}} = \frac{1}{4}$) (10