$$\lim_{x\to -2^+} f(x) = \lim_{x\to -2^-} f(x) \rightarrow \lim_{x\to -2^-} f(x) = 2\left[\frac{2-(-2^-)}{2}\right] + a\left[\frac{(-2)+2}{3}\right] = 4 + a(-1) = 4 - a$$

$$\rightarrow \lim_{x\to -2^+} f(x) = 2\left[\frac{2-(-2^+)}{2}\right] + a\left[\frac{(-2)+2}{5}\right] = 2 + a(0) = 2$$

$$\Rightarrow 4 - a = 2 \rightarrow a = 2 \rightarrow \left[\frac{a}{5}\right] = \left[\frac{2}{5}\right] = 0$$

۲-

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

$$\frac{\pi}{6} = 30^\circ \rightarrow \sin 30^\circ = \frac{1}{2}$$

۳-

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

$x(8x^2-1)$

$-\frac{1}{2}$ ریشه ساده است پس نیازی به دو شاخه کردن ندارم.

۴-

$$\lim_{x\to (-\frac{1}{2})^-} \frac{10x - 5 + [\frac{3}{x^2}]}{16x - [-\frac{2}{x^2}]} = \frac{10(-\frac{1}{2}) - 5 + [\frac{3}{(-\frac{1}{2})^2}]}{16(-\frac{1}{2}) - [\frac{-2}{(-\frac{1}{2})^2}]} = \frac{-10 + [12^-]}{-8 - [-8^-]} = \frac{1}{1} = 1$$

۵-

$$\lim_{x\to 1^+} \frac{\sin^2 \pi x}{[x] + \cos \pi x} = \frac{(0)^2}{1 + (-1)} \rightarrow \frac{\text{صفر}}{\text{صفر}}$$

$$\rightarrow \frac{\sin^2 \pi}{1 + \cos \pi} \times \frac{1 - \cos \pi}{1 - \cos \pi} = \frac{\cancel{\sin^2 x}(1 - \cos \pi)}{\cancel{1 - \cos^2 \pi}} = 1 - \cos \pi = 1 - (-1) = 2$$

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۶-

$$\lim_{x\to 1^+}\frac{\sqrt{2x+2}-\sqrt{3x+4}}{1+\sqrt[3]{x}}$$

$$\xrightarrow{hop}\frac{\left(2\times\frac{1}{2}\times\frac{1}{\sqrt{2x+2}}\right)-\left(\frac{1}{2}\times 3\times\frac{1}{\sqrt{3x+4}}\right)}{\frac{1}{3}\times 1\times\frac{1}{\sqrt[3]{x^2}}}=\frac{(1\times 1)-\left(\frac{3}{2}\times 1\right)}{\frac{1}{3}\times 1\times 1}=\frac{1-\frac{3}{2}}{\frac{1}{3}}=\frac{-\frac{1}{2}}{\frac{1}{3}}=-\frac{3}{2}$$

$$\lim_{x\to 1}\frac{2x-7\sqrt{x}+5}{2x-\sqrt{3x+1}}\xrightarrow{hop}\frac{2-\left(7\times\frac{1}{2}\times\frac{1}{\sqrt{x}}\right)}{2-\left(3\times\frac{1}{2}\times\frac{1}{\sqrt{3x+1}}\right)}=\frac{2-\frac{7}{2}}{2-\frac{3}{4}}=\frac{-\frac{1}{2}}{\frac{5}{4}}$$ ۷-

$$=-\frac{2}{5}$$

$$\lim_{x\to 0}\frac{a+\sqrt{bx+c}}{x}=\frac{1}{4}\xrightarrow{x=0}\frac{a+\sqrt{c}}{0}=\frac{0}{0}$$ پس $a=-\sqrt{c}$ ۸-

$$a^2=c=4b^2$$

$$\xrightarrow{hop}\frac{b\times\frac{1}{2}\times\frac{1}{\sqrt{bx+c}}}{1}=\frac{b}{2\sqrt{c}}=\frac{1}{4}\longrightarrow 2b=\sqrt{c}\rightarrow c=4b^2$$

$$\longrightarrow\frac{ab}{c}=\frac{2b\times b}{4b^2}=\frac{1}{2}$$

$$\lim_{x\to -2\pi}\frac{4+k\left[\frac{x}{\pi}\right]}{\sin x}=+\infty\qquad\xrightarrow{-2\pi^-}\frac{4+k\left[\frac{-2\pi}{\pi}\right]^-}{0^+}=\frac{4-3k}{0^+}=+\infty$$ ۹-

$$\xrightarrow{-2\pi^+}\frac{4+k\left[\frac{-2\pi}{\pi}\right]^+}{0^-}=\frac{4-2k}{0^-}=-\infty$$

$$4-3k>0\longrightarrow 3k<4$$

$$4-2k<0\longrightarrow 2k>4\rightarrow \frac{4}{3}<k<2$$

$$[k]=1$$

$$\lim_{x\to 8}\frac{b\sqrt{2+\sqrt[3]{x}}-2b}{ax-b}=\frac{2b-2b}{8a-b}$$ فرض $\frac{0}{0}\rightarrow 8a=b$ ۱۰-

$$ax-b\rightarrow a(x-8)$$

$$\longrightarrow\frac{8a\left(\sqrt{2+\sqrt[3]{x}}-2\right)}{a(x-8)}=\frac{8\sqrt{2+\sqrt[3]{x}}-16}{x-8}\xrightarrow{hop}\frac{\frac{1}{2}\times\frac{1}{3}\times\frac{1}{\sqrt{2+\sqrt[3]{x}}}}{1}=\frac{1}{24}$$