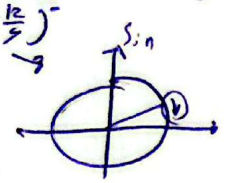
۱-

$\lim_{x \to 2^-} 2\left[\frac{x-1}{2}\right] + a\left[\frac{x+2}{2}\right]$ $\xrightarrow{x \to 2^-}$ $\begin{cases} x \to 2^- \Rightarrow 2 \\ x \to 2^- \Rightarrow 2 + (-a) \end{cases}$

$2 = 2 - a \Rightarrow a = 2$ $\quad \left[\frac{3}{2}\right] = 1$

۲-

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



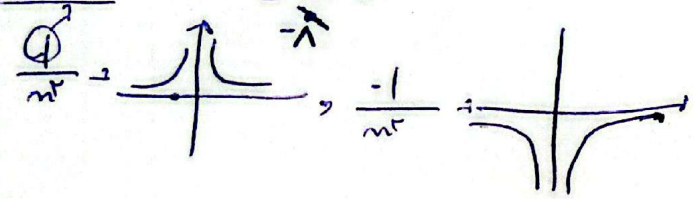
۳-

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

۴-

$\lim_{x \to (-\frac{1}{2})^-} \frac{10x - 5 + \left[\frac{3}{x^2}\right]}{12x - \left[\frac{-2}{x^2}\right]} = \frac{10x + 6}{12x - 1} = \frac{6 - 5}{-10 - 1} = \frac{1}{-12}$

$\left[\frac{3}{x^2}\right] \to 12^-$ $\quad \left[\frac{-2}{x^2}\right] \to -1^+$



۵-

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

۶-

۷-

$\lim_{x \to 81} \frac{2x - \sqrt{x} + 5}{2x - \sqrt{x} + 1} \times \frac{4}{4} = \frac{2(\sqrt{x} - 1)(\sqrt{x} - \frac{5}{2})}{2x^2 - 7x + 1}$

۸-

$$\lim_{x\to 0}\frac{a+\sqrt{bx+c}}{x}=\frac{1}{4}$$ ← وقتی مخرج صفر است و معادله حد دارد پس صورت هم صفر دوگانه است ← $a=-\sqrt{c}$

$$\text{hop}\to \frac{\frac{b}{\sqrt{bx+c}}}{1}=\frac{1}{4}\to 4b=\sqrt{bx+c}\to 4b=\sqrt{c}=-a$$

$$\frac{ab}{c}=\frac{-\sqrt{c}\,\frac{\sqrt{c}}{4}}{c}=-\frac{1}{4}$$

۹-

مساوی صفر نمی‌تواند باشد زیرا 0 مطلق می‌شود.

$$\lim_{x\to -2k}\frac{4+k\left[\frac{x}{k}\right]}{\sin x}$$

$-2k^-$ → $\frac{4-3k}{0^-}=+\infty$ → $4-3k<0\to \frac{4}{3}<k$

$-2k^+$ → $\frac{4-2k}{0^+}=+\infty$ → $4-2k>0\to 2>k$

$\to -\frac{4}{3}>-k>-2\quad [-k]=-2$

۱۰-

$$\lim_{x\to 8}\frac{b\sqrt{\sqrt[3]{x}+2}-2b}{ax-b}=\frac{0}{8a-b}$$ ← اگر بخواهیم جواب حد داشته باشد مخرج هم باید صفر شود ← $8a=b$

$$\text{hop}\to \frac{\frac{b}{\sqrt{\sqrt[3]{x}+2}\;x^{\frac{2}{3}}\,6}}{a}=\frac{\frac{b}{48}}{a}=\frac{1}{6}$$

۶-

$$\lim_{x\to 1}\frac{\sqrt{3x+3}-\sqrt{2x+4}}{1+\sqrt[3]{x}}\times\frac{2}{2}\times\frac{\text{?}}{\text{?}}\quad\frac{1-x}{1+x}=\frac{-3x+3}{3x+1}\xrightarrow{\text{hop}}\frac{-3}{2}$$