الیسا خان محمدی

۱)

$f(x) = 2\left[\frac{2-x}{2}\right] + a\left[\frac{x+2}{3}\right]$ $\qquad 4-a=2 \qquad \underline{a=2}$

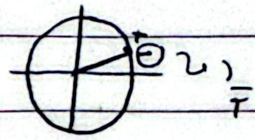
(۱) $-2^{+} \Rightarrow 2[2^{-}] + a\left[\frac{0^{+}}{3}\right] = 2$

(۲) $-2^{-} \Rightarrow 2[2^{+}] + a\left[\frac{0^{-}}{3}\right] = 4-a$

$\left[\frac{a}{3}\right] = \left[\frac{2}{3}\right] = 0$

۲)

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



۳)

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

۴)

$\lim_{x\to -\frac{1}{2}^{-}} \frac{10x - 5 + \left[\frac{3}{x^2}\right]}{16x - \left[-\frac{2}{x^2}\right]} \xrightarrow{\text{جانشانی } -\frac{1}{1/4}} \frac{-10+11}{-8^{\ominus} - (-8)} = \frac{1}{0^{-}} = -\infty$

(عدد صحیح)

۵)

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

$[x] = 1$

۶)

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

[عقلونی باید در صورت و مخرج مثل و مخفف فرم مبهم باشن Hop استفاده کنیم چون $\frac{0}{0}$]

ریشه‌ی سوم ⊕ یا ⊖ فرقی ندارد.

$$\lim_{x \to 1} \frac{2x - \sqrt{x} + 3}{2x - \sqrt{2x+1}} \xrightarrow{\text{H.O.P}} \frac{2 - \frac{1}{2\sqrt{x}}}{2 - \frac{2}{2\sqrt{2x+1}}} = \frac{2 - \frac{1}{2}}{2 - \frac{2}{4}}$$ (٧)

$$\frac{-\frac{3}{2}}{\frac{5}{4}} = -\frac{6}{5}$$

$\lim_{x\to 0} \frac{a+\sqrt{bx+c}}{x} = \frac{1}{2}$ H.O.P $\rightarrow \frac{b}{2\sqrt{bx+c}} = \frac{1}{2^2}$ (٨)

$b = \sqrt{bx+c}$ $\quad 2b^2 = bx+c$ $\quad x=0$ $\quad b = \frac{\sqrt{c}}{2}$

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

(٩)

$\lim_{x\to -2\pi} \frac{f+K\left[\frac{x}{\pi}\right]}{\sin x} = +\infty$

$\left[\frac{x}{\pi}\right] = \left[\frac{-2\pi}{\pi}\right]$

① $-2\pi^+$ $\quad \frac{f+(-2)K}{\sin -2\pi^+} = \frac{f-2K}{0^+} = +\infty$

$-2\pi^-$ $\quad \frac{f+(-2)K}{\sin -2\pi^-} = \frac{4-2K}{0^-} = +\infty$

$f-2K<0$ $\quad 2K>4$

$f-2K>0$ $\quad K>2$

$4-2K<0$ $\quad 2K<4$ $\quad K<2$

$3K<4$ $\quad K<\frac{4}{3}$

$4-2K>0$ $\quad 2K>4$ $\quad K>2$

$\frac{4}{3}<K<2$ $\quad [-K] = -2$

(١٠)

$\lim_{x\to 8} \frac{b\sqrt{2+\sqrt[3]{x}}-2b}{9x-b}$

$8a-b=0$ $\quad b=8a$ $\quad$ H.O.P $\quad \frac{b\sqrt{2+\sqrt[3]{x}}\cdot\frac{1}{3\sqrt[3]{x^2}}}{9} = \frac{b}{72} = \frac{8a}{72} = \frac{a}{9}$

$b\sqrt{2+\sqrt[3]{8}} = 9b$ $\quad 2b = 9b$ $\quad 8b = 9b$