

$$\lim_{x \rightarrow -2} 2 \left[\frac{2-x}{2} \right] + a \left[\frac{x+2}{3} \right]$$

$$\left. \begin{aligned} x \rightarrow -2^+ & \quad 2[2^-] + a[0^+] = 2 + 0 \\ x \rightarrow -2^- & \quad 2[2^+] + a[0^-] = 2 - a \end{aligned} \right\} \begin{aligned} 2 &= 2 - a \\ a &= 2 \end{aligned}$$

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

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

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

چون داخل براکت
عدد صحیح نمی شود نیازی
به دو شاخه کردن ندارد

$$\lim_{x \rightarrow (-\frac{1}{2})^-} \frac{10x - 5 + \left[\frac{3}{x^2} \right]}{19x - \left[-\frac{2}{x^2} \right]} \rightarrow \frac{10x - 5 + [12^-]}{19x - [-1^+]} \rightarrow \lim_{x \rightarrow (-\frac{1}{2})^-} \frac{10x - 5 + 11}{19x + 1} = \frac{1}{-9} = -\frac{1}{9}$$

$$-\frac{1}{2} > x \rightarrow x^2 > \frac{1}{4} \rightarrow \frac{3}{x^2} < 12$$

$$-\frac{1}{2} > x \rightarrow x^2 > \frac{1}{4} \rightarrow \frac{2}{x^2} < 1 \rightarrow -\frac{2}{x^2} > -1$$

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

$$\lim_{x \rightarrow -1} \frac{\sqrt{2x+3} - \sqrt{2x+1}}{1 + \sqrt{x}} \times \frac{\sqrt{2x+3} + \sqrt{2x+1}}{\sqrt{2x+3} + \sqrt{2x+1}} \times \frac{1 - \sqrt{x} + \sqrt{x^2}}{1 - \sqrt{x} + \sqrt{x^2}} = \frac{-1 - x}{1 + x} \times \frac{1 - \sqrt{x} + \sqrt{x^2}}{\sqrt{2x+3} + \sqrt{2x+1}}$$

$$\Rightarrow = \left(-\frac{1}{2}\right) \checkmark$$

2

$$\lim_{x \rightarrow 1} \frac{(x\sqrt{x}-1)(\sqrt{x}-1)}{x^2 - \sqrt{x^2+1}} \times \frac{x + \sqrt{x^2+1}}{x + \sqrt{x^2+1}} = \frac{(x\sqrt{x}-1)(\sqrt{x}-1) \times (x + \sqrt{x^2+1})}{(x^2 - 1)(x + \sqrt{x^2+1})} = \left(-\frac{1}{2}\right)$$

$\frac{(x+1)(x-1)}{1 \cdot \sqrt{x^2+1}}$

✓

2

$$\lim_{x \rightarrow 0} \frac{a + \sqrt{bx+c}}{x} = \frac{1}{f} \rightarrow \frac{a + \sqrt{c}}{0} = \frac{1}{f} \rightarrow a = -\sqrt{c}$$

hop $\rightarrow \frac{b}{\sqrt{bx+c}} = \frac{1}{x} \rightarrow \sqrt{bx+c} = \sqrt{c}$

$$\frac{a+b}{x} = \frac{1}{x} \rightarrow \frac{a+b}{x} = \frac{1}{x} \rightarrow \frac{a+b}{x} = \frac{1}{x}$$

2

$$\lim_{x \rightarrow -\pi} \frac{f + k \left[\frac{x}{\pi}\right]}{\sin x} = +\infty \quad \left\{ \begin{array}{l} x \rightarrow -\pi^+ \quad \frac{f - \pi k}{0^+} = +\infty \rightarrow f - \pi k > 0 \rightarrow \pi > k \\ x \rightarrow -\pi^- \quad \frac{f - \pi k}{0^-} = +\infty \rightarrow f - \pi k < 0 \rightarrow \frac{\pi}{f} < k \end{array} \right\} \frac{\pi}{f} < k < \pi$$

$$[-k] \leq \left(-\frac{\pi}{f}\right)$$

$$\lim_{x \rightarrow \infty} \frac{b\sqrt{1+\sqrt{x}} - \pi b}{ax - b} = \frac{\pi b - \pi b}{\infty a - b} \xrightarrow{\text{L'Hopital}} \lim_{x \rightarrow \infty} \frac{b\sqrt{1+\sqrt{x}}}{ax} = \frac{b}{a}$$

2

$$\lim_{x \rightarrow \infty} \frac{b\sqrt{1+\sqrt{x}} - \pi b}{\frac{bx}{\lambda} - b} = \frac{\sqrt{1+\sqrt{x}} - \pi}{\frac{x}{\lambda} - 1} \times \frac{\sqrt{1+\sqrt{x}} + \pi}{\sqrt{1+\sqrt{x}} + \pi} = \frac{1}{\lambda} \times \frac{1}{\sqrt{1+\sqrt{x}} + \pi} = \frac{1}{\lambda}$$