آروین کالی زاده

(1)

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

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

$$\Rightarrow 4 - a = 2 \Rightarrow a = 2$$

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

(2)

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

$$\Rightarrow \left[2\sin\frac{\pi^-}{6} - 1\right] = -1$$

(3)

$$\lim_{x\to -\frac{1}{2}} [8x^3 - x] \xrightarrow{\text{اما نیاز نیست دو بار حد بگیریم چون تابع ... جایگذاری ... می‌کنیم}} \left[8\times\left(-\frac{1}{8}\right) + \frac{1}{2}\right] = \left[-1 + \frac{1}{2}\right] = \left[-\frac{1}{2}\right] = -1$$

(4)

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

(5)

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

$$= 1 - \cos \pi x = 1 - \cos \pi = 1 - (-1) = 2$$

(6)

$$\lim_{x\to -1} \frac{\sqrt{2x+3} - \sqrt{3x+4}}{1 + \sqrt[3]{x}} \xrightarrow{\text{اتحاد}} \times \frac{\ldots}{\ldots} \times \frac{\ldots}{\ldots} = \frac{\overset{(-1)}{\cancel{-(x+1)}}}{\cancel{x+1}} \times \frac{3}{1} \times \frac{1}{2} = -\frac{3}{2}$$

(۷

$$\lim_{x\to 1}\frac{3x-7\sqrt{x}+5}{\frac{3x-\sqrt{?x+1}}{4x^2-3x+1}}\times\frac{3}{2}$$

$$=\frac{3x-7\sqrt{x}+5}{4x^2-3x-1}\xrightarrow{\text{هوپ}}\frac{(\sqrt{x}-1)(3\sqrt{x}-5)}{\underset{(\sqrt{x}-1)(\sqrt{x}+1)}{\cancel{(x-1)}}\quad(4x+1)}\times 2$$

$$=\frac{8\sqrt{x}-20}{(\sqrt{x}+1)(4x+1)}=\frac{8-20}{2\times 5}=\frac{-12}{10}=\frac{-6}{5}$$

(۸

$$\lim_{x\to 0}\frac{a+\sqrt{bx+c}}{x}=\frac{1}{4}\xrightarrow[\text{باید صورت هم صفر شود.}]{\text{چون مخرج صفر شده و جواب عدد شده پس}} a+\sqrt{c}=0\Rightarrow\sqrt{c}=-a \quad ①$$

هوپ

$$\overset{\text{HoP}}{\Rightarrow}\frac{\frac{b}{2\sqrt{bx+c}}}{1}=\frac{b}{2\sqrt{c}}=\frac{1}{4}\Rightarrow\frac{b}{\sqrt{c}}=\frac{1}{2}\Rightarrow\sqrt{c}=-a=2b \quad ①$$

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

(۹

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

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

$$\Rightarrow -2<-k<-\frac{4}{3}\Rightarrow[-k]=-2$$

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

Sibo

Date..................

۱۰)

$$\lim_{x\to 8}\frac{b\sqrt{2+\sqrt[3]{x}}-2b}{ax-b}=\frac{2b-2b}{8a-b}=\frac{0}{8a-b}$$ ⇐ جواب باید شود

$8a-b=0 \Rightarrow 8a=b$

حقیقتا اینجا هیچ ایده‌ای نداشتم اینجا رو تقلب زدم :)

جایگذاری در صورت و مخرج

$$\Rightarrow \frac{8a\sqrt{2+\sqrt[3]{x}}-16a}{ax-8a}=\frac{8\sqrt{2+\sqrt[3]{x}}-16}{x-8}=\frac{0}{0}$$

$$\overset{Hop}{\Longrightarrow} \frac{\dfrac{\frac{8}{3\sqrt[3]{x^2}}}{2\sqrt{(2+\sqrt[3]{x})^2}}}{1}=\frac{1}{6}$$