۱۹٫۷۵

پاسخ آموزشی - تکلیف ۱۹

-۱

$$\lim_{x\to -۲^+} f(x) = \lim_{x\to -۲^-} f(x)$$

$$\lim_{x\to -۲^+} ۲\left[\frac{۲-x}{۲}\right] + a\left[\frac{x+۲}{۳}\right] - ۲\times[۲^-] + a[۰^+] = ۲$$

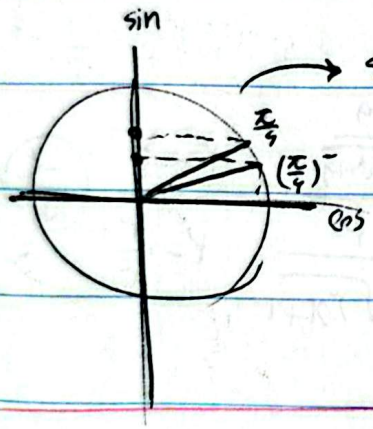
$$\lim_{x\to -۲^-} ۲\left[\frac{۲-x}{۲}\right] + a\left[\frac{x+۲}{۳}\right] = ۲\times[۲^+] + a[۰^-] = ۴ - a$$

$۲ = ۴ - a \longrightarrow (a = ۲)$ ✓

$\left[\frac{a}{۳}\right] = \left[\frac{۲}{۳}\right] = ۰$

۱٫۷۵

-۲



$\sin(\frac{\pi}{۶})^- < \frac{۱}{۲}$

$$\lim_{x\to(\frac{\pi}{۶})^-} [۲\sin x - ۱] = [۱^- - ۱] = [۰^-] = -۱$$ ✓

۲

-۳

$$\lim_{x\to\frac{-۱}{۲}} [۸x^۳ - x] = [۸\times\frac{-۱}{۸} + \frac{۱}{۲}] = [\frac{-۱}{۲}] = -۱$$ ✓

۴

-۴

$$\lim_{x\to(\frac{-۱}{۲})^-} \frac{۱۰x - ۵ + [\frac{۳}{x^۲}]}{۱۹x - [\frac{-۲}{x^۲}]} = \frac{-۵^- - ۵ + [۱۲^-]}{-۸^- - [-۸^+]} = \frac{-۱۰^- + ۱۱}{-۸^- + ۸} = \frac{۱^-}{۰^-} = -\infty$$ ✓

۲

$$\begin{cases} x < \frac{-۱}{۲} \longrightarrow x^۲ > \frac{۱}{۴} \longrightarrow \frac{۱}{x^۲} < ۴ \longrightarrow \frac{۳}{x^۲} < ۱۲ \\ \hookrightarrow \frac{-۲}{x^۲} > -۸ \end{cases}$$

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

$$1-\cos \pi = 2$$

$$\lim_{x\to -1} \frac{\sqrt{2x+3}-\sqrt{3x+5}}{1+\sqrt[3]{x}} \overset{\text{هوپیتال}}{\Rightarrow} \frac{\frac{2}{2\sqrt{2x+3}} - \frac{3}{2\sqrt{3x+5}}}{\frac{1}{3\sqrt[3]{x^2}}} = \frac{1-\frac{3}{2}}{\frac{1}{3}} = \frac{-3}{2}$$

$$\lim_{x\to 1} \frac{2x-\sqrt{\sqrt{3x}+5}}{2x-\sqrt{3x+1}} \overset{\text{هوپیتال}}{\Longrightarrow} \frac{2-\frac{3}{2\sqrt{3x}}}{2-\frac{3}{2\sqrt{3x+1}}} = \frac{2-\frac{3}{4}}{2-\frac{3}{4}} = \frac{-3}{5}$$

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

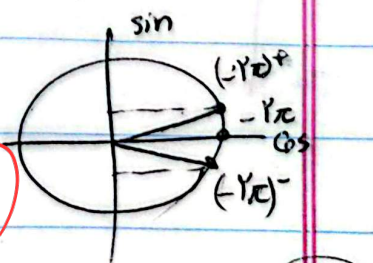
$$a=-\sqrt{c}$$

چون $\frac{0}{0}$ هوپیتال $\Longrightarrow \frac{b}{2\sqrt{bx+c}} = \frac{1}{4} \to 2b=\sqrt{c}$

$$b=\frac{\sqrt{c}}{2}$$

$$\frac{ab}{c} = \frac{-\sqrt{c}\times\sqrt{c}}{2c} = \frac{-1}{2}$$

$$\begin{cases} \lim_{x\to -2\pi^+} \frac{4+k\left[\frac{x}{\pi}\right]}{\sin x} = \frac{4-2k}{0^+} = +\infty \to 4-2k>0 \to k<2 \quad (I) \\ \lim_{x\to -2\pi^-} \frac{4+k\left[\frac{x}{\pi}\right]}{\sin x} = \frac{4-3k}{0^-} = +\infty \end{cases}$$



$$4-3k<0 \to 3k>4 \to k>\frac{4}{3} \quad (II)$$

$$(I),(II) \to \frac{4}{3}<k<2 \to -2<-k<-\frac{4}{3}$$

$$[-k]=-2$$

$$\lim_{x\to 1} \frac{b\sqrt{2+\sqrt[3]{x}} - 2b}{ax-b} = \frac{2b\sqrt{b}}{1a-b} = \frac{0}{1a-b} \xrightarrow[\text{عبد صفر است}]{\text{چون جواب}} 1a=b$$

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$$-\lim_{x\to 1} \frac{1a\sqrt{2+\sqrt[3]{x}} - 2b}{ax-b} \xrightarrow{\text{هوپیتال}} \frac{1\not{a} \times \frac{\frac{1}{\sqrt[3]{x^2}}}{2\sqrt{2+\sqrt[3]{x}}}}{\not{a}} = \frac{1 \times \frac{1}{12}}{4} = \frac{1}{9}$$

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