Date: Subject: (۱۹) باران نسیمی

۱۹/۱۷.۵ آفرین

-۱

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

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

$$x \to -۲^- \Rightarrow ۲\underbrace{\left[\frac{۴^+}{۲}\right]}_{۴} + a\underbrace{\left[\frac{۰^-}{۳}\right]}_{-۱} \Rightarrow ۴ - a = ۲ \Rightarrow \boxed{a = ۲}$$

$$\to \left[\frac{۲}{۳}\right] = ۰$$

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-۲

$$\lim_{x\to(\frac{\pi}{۴})^-} [۲\sin x - ۱] = \lim [\underbrace{۱^-}_{۰^-} - ۱] = -۱$$

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-۳

$$\lim_{x\to -\frac{۱}{۲}} [۸x^۳ - x] = \begin{cases} -\frac{۱}{۲}^+ \to [-۱^+ + \frac{۱}{۲}^-] = -۱ \\ -\frac{۱}{۲}^- \to [-۱^- + \frac{۱}{۲}^+] = -۱ \end{cases}$$

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

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-۴

$$\lim_{x\to(-\frac{۱}{۲})^-} \frac{۱۰x - ۵ + \overbrace{\left[\frac{۳}{۲x^۲}\right]}^{۱۲^-}}{۱۶x - \underbrace{\left[-\frac{۲}{x^۲}\right]}_{-۸^+ \,\to\, -۸}} = \frac{\overbrace{-۵^- - ۵}^{-۱۰^-} + ۱۱}{-۸^- + ۸} = \frac{۱}{۰^-} = -\infty$$

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-۵

$$\lim_{x\to ۱^+} \frac{\sin^۲ \pi x}{[x] + \cos \pi x} =$$

$$\frac{۱ - \cos^۲ \pi x}{۱ + \cos \pi x} = \frac{(\cancel{۱ + \cos \pi x})(۱ - \cos \pi x)}{\cancel{۱ + \cos \pi x}} = ۱ - \cos \pi x \to ۲$$

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-۶

$$\lim_{x\to -۱} \frac{\sqrt{۲x+۳} - \sqrt{۳x+۴}}{۱ + \sqrt[۳]{x}} \xrightarrow{HOP} \frac{\frac{۲}{۲\sqrt{۲x+۳}} - \frac{۳}{۲\sqrt{۳x+۴}}}{\underbrace{\frac{۱}{۳\sqrt[۳]{x^۲}}}_{۳}} = \left(\frac{-\frac{۱}{۲}}{\frac{۱}{۳}}\right) = \frac{-۳}{۲}$$

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Date: Subject:

۷-

$$\lim_{x\to 1} \frac{2x-7\sqrt{x}+5}{2x-\sqrt{3x+1}} \xrightarrow{Hop} \frac{2-\frac{7}{2\sqrt{x}}}{2-\frac{3}{2\sqrt{3x+1}}} = \frac{\left(\frac{-5}{2}\right)}{\left(\frac{5}{4}\right)} = \frac{-4}{2} = -2$$

$$\frac{2-\frac{7}{2}}{2-\frac{3}{4}} = \frac{-\frac{3}{2}}{\frac{5}{4}} = -1{,}2$$

۱٫۷۵

۸-

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

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$$a+\sqrt{bx+c} \xrightarrow{x=0} a+\sqrt{c} = 0$$

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

$$\xrightarrow{Hop} \frac{b}{2\sqrt{bx+c}} \Rightarrow \frac{1}{4} = \frac{b}{2\sqrt{c}} \qquad \Longrightarrow \frac{ab}{c} = \frac{-\sqrt{c}\times\frac{\sqrt{c}}{2}}{c} = \frac{\left(\frac{-c}{2}\right)}{\left(\frac{c}{1}\right)} = \frac{-1}{2}$$

$$2\sqrt{c} = 4b \rightarrow \sqrt{c} = 2b$$

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

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

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$$-2\pi^{+} \qquad \frac{4+k\left[\frac{-1{,}9\,\pi}{\pi}\right]}{\underbrace{\sin(-2\pi)^{+}}_{\text{ربع اول}}} = \frac{4-2k}{0^{+}} \rightarrow 4-2k>0$$

$$4>2k \rightarrow 2>k$$

$$-2\pi^{-} \qquad \frac{4+k\left[\frac{-2{,}1\,\pi}{\pi}\right]}{\underbrace{\sin(-2\pi^{-})}_{\text{ربع چهارم}}} = \frac{4-3k}{0^{-}} \rightarrow 4-3k<0 \rightarrow 4<3k$$

$$\frac{4}{3}<k$$

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

۱۰-

$$\lim_{x\to 8} \frac{b\sqrt{2+\sqrt[3]{x}}-2b}{ax-b} \rightarrow \frac{8a\sqrt{2+\sqrt[3]{x}}-16a}{ax-8a} = \frac{8\cancel{a}(\sqrt{2+\sqrt[3]{x}}-2)}{\cancel{a}(x-8)} \times \frac{\sqrt{2+\sqrt[3]{x}}+2}{\sqrt{2+\sqrt[3]{x}}+2}$$

$$8a-b=0$$

$$b=8a$$

$$\Rightarrow \frac{8(2+\sqrt[3]{x}-4)}{(x-8)(\sqrt{2+\sqrt[3]{x}}+2)} = \frac{8(\sqrt[3]{x}-2)}{(x-8)(\sqrt{2+\sqrt[3]{x}}+2)} \times \frac{\sqrt[3]{x^2}+2\sqrt[3]{x}+4}{\sqrt[3]{x^2}+2\sqrt[3]{x}+4}$$

$$\lim_{x\to 8} = \frac{\cancel{8}^{\,1}\cancel{(x-8)}}{\cancel{(x-8)}\underbrace{(\sqrt{2+\sqrt[3]{x}}+2)}_{\cancel{4}}\underbrace{(\sqrt[3]{x^2}+2\sqrt[3]{x}+4)}_{\cancel{12}\;9}} = \frac{1}{9}$$

۹

آذین مهر

$$\lim \frac{(\sqrt{x}-1)(2\sqrt{x}-5)}{2x-\sqrt{3x+1}} \times \frac{2x+\sqrt{3x+1}}{2x+\sqrt{3x+1}} = \frac{(\sqrt{x}-1)(2\sqrt{x}-5)\times 4}{4x^2-3x-1}$$

$$\lim \frac{\cancel{(\sqrt{x}-1)}(2\sqrt{x}-5)\times 4}{\underset{\sqrt{x}+1}{\cancel{(x-1)}}(4x+1)} = \lim \frac{[2(1)-5]\times 4}{(4(1)+1)\times 2} = -1.2$$