۱۴/۷۵

SUBJECT: ....

مهسا خلوصی – پاسخ تشریحی تکلیف ۱۹

$$f(x) = ۲\left[\frac{۲-x}{۲}\right] + a\left[\frac{x+۲}{۳}\right] \qquad x=-۲ \qquad \left[\frac{a}{۳}\right] = ?$$

(۱)

$$x \to -۲^+ \qquad ۲\left[\frac{۳,۸}{۲}\right] + a\left[\frac{-۱,۸+۲}{۳}\right] = ۲ \qquad ۲ = ۴-a$$

$$\boxed{a=۲}$$

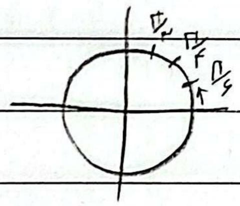
$$x \to -۲^- \qquad ۲\left[\frac{۴,۲}{۲}\right] + a\left[\frac{-۰,۲}{۳}\right] = ۴-a$$

$$\left[\frac{۲}{۳}\right] = ۰$$

۲

(۲)

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



۲

(۳)

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

$$x \to \left(-\tfrac{۱}{۲}\right)^+ \qquad \left[۸\left(-\tfrac{۱}{۸}\right)^+ + \tfrac{۱}{۲}\right] = -۱$$

$$x \to \left(-\tfrac{۱}{۲}\right)^- \qquad \left[۸\left(-\tfrac{۱}{۸}\right)^- + \tfrac{۱}{۲}\right] = -۱$$

$$x(۸x^۲-۱) \qquad ۸x^۲ = ۱$$

$$x^۲ = \frac{۱}{۸} \to x = \pm\frac{۱}{۲\sqrt{۲}}$$

$-\frac{۱}{۲\sqrt{۲}}$		۰		$\frac{۱}{۲\sqrt{۲}}$	
−	+		−		+

−۱

۲

(۴)

$$\lim_{x\to(-\frac{۱}{۴})^-} \frac{۱۰x-۵+\left[\frac{۳}{x^۲}\right]}{۱۶x-\left[\frac{-۲}{x^۲}\right]} = \frac{۱۰x+۶}{۱۶x+۸} = \frac{-۵-۵+۱۱}{-۸^-+۸} = \frac{۱}{۰^-} = -\infty$$

$$\left[\frac{۳}{x^۲}\right] = \left[\frac{۳}{(\frac{۱}{۴})^+}\right] = [۱۲^-] = ۱۱$$

$$\left[\frac{-۲}{x^۲}\right] = \left[-\frac{۲}{(\frac{۱}{۴})^+}\right] = [-۸^-] = -۸$$

۲

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SUBJECT: .... $1-\cos^2 \pi x$ ۱۹ پاسخ تشریحی تکلیف ۲ حسابان •

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

$[1]=1$

$$= 1-\cos \pi = 1-(-1) = 2$$ ✓

۵   ۲

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

$$\frac{\sqrt{2x+3}-\sqrt{3x+4}}{1+\sqrt[3]{x}} \times \frac{1+\sqrt[3]{x^2}-\sqrt[3]{x}}{1+\sqrt[3]{x^2}-\sqrt[3]{x}} \times \frac{\sqrt{2x+3}+\sqrt{3x+4}}{\sqrt{2x+3}+\sqrt{3x+4}}$$

۶

$$= \frac{\overset{-(x+1)}{(-x-1)} \times 3}{\cancel{(x+1)} \times 2} = -\frac{3}{2}$$ ✓

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$$\lim_{x\to 1} \frac{2x-7\sqrt{x}+5}{2x-\sqrt{3x+1}} = \frac{(\sqrt{x}-1)2(\sqrt{x}-\frac{5}{2})}{2x-\sqrt{3x+1}} \times \frac{2x+\sqrt{3x+1}}{2x+\sqrt{3x+1}}$$

$$\underbrace{\qquad\qquad\qquad}_{4x^2-3x-1 = (x-1)4(x+\frac{1}{4})}$$

۱٫۷۵   ۷

$$= \frac{\cancel{(\sqrt{x}-1)}2(\sqrt{x}-\frac{5}{2})\times 4}{\cancel{(\sqrt{x}-1)}(\sqrt{x}+1)4(x+\frac{1}{4})} = \frac{2\times -\frac{3}{2}}{2\times 4\times\frac{5}{4}} = \frac{-9}{10} \quad \frac{-12}{10}$$

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

۸

$$-2\pi^+ \quad \frac{4-2k}{0^+} = +\infty \to 4-2k>0 \to 2>k$$

$$-2\pi^- \quad \frac{4-3k}{0^-} = +\infty \to 4-3k<0 \to \frac{4}{3}<k$$

$[-k] = -2$ ✓

$$-\frac{4}{3} > -k > -2 \leftarrow \frac{4}{3}<k<2$$

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SUBJECT : ....

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

$$\frac{a+\sqrt{bx+c}}{x} \times \frac{a-\sqrt{bx+c}}{a-\sqrt{bx+c}} = \frac{a^2-bx-c}{x \times (a-\sqrt{c})}$$

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$$a+\sqrt{c}=0$$
$$-\sqrt{c}=a \longrightarrow a^2=c$$

$$\frac{a^2-bx-c}{x(a-\sqrt{c})} = \frac{1}{4} \longrightarrow \frac{-b\cancel{x}}{+2a\cancel{x}} = \frac{1}{4} \longrightarrow -4b=2a$$
$$-2b=a$$
$$b=\frac{-a}{2}$$

$$\frac{ab}{c} = \frac{\cancel{a} \times -\frac{\cancel{a}}{2}}{\cancel{a^2}} = -\frac{1}{2}$$

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$$\lim_{x\to 8} \frac{b\sqrt{2+\sqrt[3]{x}}-2b}{ax-b} \quad \frac{0}{0} \qquad (8a=b) *$$

$$b^2(-2+\sqrt[3]{x})$$

$$\lim_{x\to 8} \frac{b^2(2+\sqrt[3]{x})-4b^2}{(ax-b)(4a)} \longrightarrow \lim_{x\to 8} \frac{-2b^2+\sqrt[3]{x}\, b^2}{(ax-b)(4b)} \overset{*}{\longrightarrow}$$

$$\lim_{x\to 8} \frac{b(\sqrt[3]{x}-2)}{ax-8a} \longrightarrow \lim_{x\to 8} \frac{\overset{2\ 8a}{b}(\cancel{\sqrt[3]{x}-2})}{4\cancel{a}\underbrace{(x-8)}_{(\cancel{\sqrt[3]{x}-2})(\sqrt[3]{x^2}+2\sqrt[3]{x}+4)}}$$

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$$\Rightarrow \lim_{x\to 8} \frac{2}{\sqrt[3]{x^2}+2\sqrt[3]{x}+4} = \frac{2}{12} = \frac{1}{6}$$

۱۰

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