Subject : یازدهم رشته ریاضی — تکلیف ۳۵ — Date: محمدامین مختاری — ۲۰

۱) $\lim_{x\to 1} \frac{4x^2-7x+3}{5x^2-8x+3} \Rightarrow \frac{0}{0} \longrightarrow \frac{4(x-\frac{3}{4})(x-1)}{5(x-\frac{3}{5})(x-1)} \Rightarrow \frac{4\times\frac{1}{4}}{5\times\frac{2}{5}} = \boxed{\frac{1}{2}}$ ۹

۲) $\lim_{x\to 0} \frac{|3x-1|-|3x+1|}{x} \Rightarrow \frac{0}{0} \longrightarrow \frac{-(3x-1)-(3x+1)}{x} = \frac{-6x}{x} = \boxed{-6}$ ۹

$x\to 0 \Rightarrow 3x-1<0 \Rightarrow |3x-1| \to -3x+1$

۳) $\lim_{x\to 4} \frac{x-4}{\sqrt{x}-2} \Rightarrow \frac{0}{0} \longrightarrow \frac{(\sqrt{x}-2)(\sqrt{x}+2)}{(\sqrt{x}-2)} = \sqrt{x}+2 = 2+2 = 4$ ۵

۴) $\lim_{x\to 2} \frac{x-\sqrt{2x}}{2x^2-x-6} \Rightarrow \frac{0}{0} \longrightarrow \frac{\sqrt{x}(\sqrt{x}-\sqrt{2})}{2(x+\frac{3}{2})(x-2)} = \frac{\sqrt{x}(\sqrt{x}-\sqrt{2})}{2(x+\frac{3}{2})(\sqrt{x}-\sqrt{2})(\sqrt{x}+\sqrt{2})}$ ۹

$\frac{\sqrt{x}}{2(x+\frac{3}{2})(\sqrt{x}+\sqrt{2})} = \frac{\sqrt{2}}{2(\frac{7}{2})(2\sqrt{2})} = \boxed{\frac{1}{14}}$

۵) $\lim_{x\to 1} \frac{1-\sqrt{x}}{2-\sqrt{5-x}} \Rightarrow \frac{0}{0} \longrightarrow \frac{1-\sqrt{x}}{2-\sqrt{5-x}} \times \frac{2+\sqrt{5-x}}{2+\sqrt{5-x}} \times \frac{1+\sqrt{x}}{1+\sqrt{x}}$ ۹

$\frac{1-x}{4-5+x} \times 2 = \frac{2(-1)(1-x)}{(x-1)} = \boxed{-2}$

$4-5+x = -1+x$

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(۶)

$$\lim \frac{\sqrt{۳x+۴}-۴}{\sqrt[۳]{۵x+۷}-۳} \to \frac{۰}{۰} \to \frac{\sqrt{۳x+۴}-۴}{\sqrt[۳]{۵x+۷}-۳} \times \frac{\sqrt[۳]{(۵x+۷)^۲}+۹-۳\sqrt[۳]{۵x+۷}}{\sqrt[۳]{(۵x+۷)^۲}+۹-۳\sqrt[۳]{۵x+۷}} \times \frac{\sqrt{۳x-۴}+۴}{\sqrt{۳x-۴}+۴}$$

$$\frac{۳x+۴-۱۶}{۵x+۷-۲۷} \times \frac{۲۷}{۸} \Rightarrow \frac{۳x-۱۲}{۵x-۲۰} \times \frac{۲۷}{۸} = \frac{۳(x-۴)}{۵(x-۴)} \times \frac{۲۷}{۸} = \frac{۸۱}{۴۰}$$

(۷)

$$\lim_{x \to ۱} \frac{\sqrt[۳]{x+\sqrt{x}}-۲}{\sqrt[۳]{x}-۱} \Rightarrow \frac{۰}{۰} \to \frac{\sqrt[۳]{x+\sqrt{x}}-۲}{\sqrt[۳]{x}-۱} \times \frac{\sqrt[۳]{x^۲}+۱+\sqrt[۳]{x}}{\sqrt[۳]{x^۲}+۱+\sqrt[۳]{x}} \times \frac{\sqrt[۳]{x+\sqrt{x}}+۲}{\sqrt[۳]{x+\sqrt{x}}+۲}$$

$$\frac{x+\sqrt{x}-۶}{x-۱} \times \frac{۳}{۲} = \frac{۳(\sqrt{x}+۳)(\sqrt{x}-۱)}{۲(\sqrt{x}-۱)(\sqrt{x}+۱)} = \frac{۳(\frac{۵}{۳}) \times ۳}{۲ \times ۲} \Rightarrow \frac{۴۵}{۸}$$

(۸)

$$\lim_{x \to \pi} \frac{۱+\cos^۲ x}{\sin^۲ x} \Rightarrow \frac{۰}{۰} \to \frac{(۱+\cos x)(۱+\cos^۲ x-\cos x)}{(۱+\cos x)(۱-\cos x)}$$

$$۱-\cos^۲ x \to (۱+\cos x)(۱-\cos x)$$

$$\frac{\cos^۲ x-\cos x+۱}{۱-\cos x} = \frac{۱-(-۱)+۱}{۱-(-۱)} = \frac{۳}{۲}$$

(۹)

$$\lim_{x \to \frac{\pi}{۴}} \frac{۱-\tan x}{\sin x-\cos x} \Rightarrow \frac{۰}{۰} \to \frac{۱-\frac{\sin x}{\cos x}}{\sin x-\cos x} = \frac{\frac{\cos x-\sin x}{\cos x}}{\sin x-\cos x} = \frac{-۱}{\cos x}$$

$\frac{\pi}{۴}$	$\frac{\sqrt{۲}}{۲}$

$$\frac{-۱}{\frac{\sqrt{۲}}{۲}} = \frac{-۲}{\sqrt{۲}} = \frac{-۲\sqrt{۲}}{۲} = -\sqrt{۲}$$

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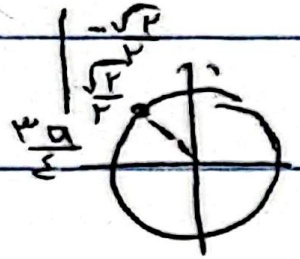
$$\lim_{x \to \frac{3\pi}{4}} \frac{\tan^2 x - 1}{\cos^2 x} \Rightarrow \frac{0}{0} \rightarrow \frac{\frac{\sin^2 x - 1}{\cos^2 x}}{\cos^2 x - \sin^2 x} = \frac{\sin^2 x - \cos^2 x}{\cos^2 x - \sin^2 x} = \frac{1}{\cos^2 x}$$



$$\frac{-1}{\frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2}} \Rightarrow -2$$

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