Subject: (آلالادینی - یازدهم ریاضی) ۱۸ تکلیف ۳۰ Date:

۱) $\lim_{x\to 1} \dfrac{4x^2-7x+3}{5x^2-8x+3} = \dfrac{0}{0}$ مبهم $\xrightarrow{hop} \lim_{x\to 1} \dfrac{8x-7}{10x-8} = \dfrac{8-7}{10-8} = +\dfrac{1}{2}$ ۴

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۲) $x\to 0^+ : \dfrac{3x-1-3x-1}{x} = \dfrac{-2}{0^+} = -\infty$

$x\to 0^- : \dfrac{1-\cancel{3x}+\cancel{3x}+1}{x} = \dfrac{2}{0^-} = -\infty$ ۰

در $x=0$ حد ندارد

$\dfrac{-3x+1-3x-1}{x} = -6$

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۳) $\lim_{x\to 4} \dfrac{x-4}{\sqrt{x}-2} = \dfrac{0}{0}$ مبهم رفع $\lim_{x\to 4} \dfrac{(\cancel{\sqrt{x}-2})(\sqrt{x}+2)}{\cancel{\sqrt{x}-2}} = \sqrt{4}+2 = 4$ ۴

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۴) $\lim_{x\to 2} \dfrac{x-\sqrt{2x}}{2x^2-x-6} = \dfrac{0}{0}$ مبهم رفع $\lim_{x\to 2} \dfrac{x-\sqrt{2x}}{2x^2-x-6} \times \dfrac{x+\sqrt{2x}}{x+\sqrt{2x}}$ ۴

$= \lim_{x\to 2} \dfrac{x^2-2x}{(2x^2-x-6)(x+\sqrt{2x})} = \dfrac{x(\cancel{x-2})}{(\cancel{x-2})(2x+3)(x+\sqrt{2x})} = \dfrac{2}{7\times 4} = \dfrac{1}{14}$

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۵) $\lim_{x\to 1} \dfrac{1-\sqrt{x}}{2-\sqrt{5-x}} = \dfrac{0}{0}$ مبهم رفع $\lim_{x\to 1} \dfrac{1-\sqrt{x}}{2-\sqrt{5-x}} \times \dfrac{1+\sqrt{x}}{1+\sqrt{x}} \times \dfrac{2+\sqrt{5-x}}{2+\sqrt{5-x}}$

$= \lim_{x\to 1} \dfrac{(\cancel{1-x})(2+\sqrt{5-x})}{(1+\sqrt{x})(4-5+x)} = \dfrac{4}{-2} = -2$ ۴

$4-5+x = -(\cancel{1-x})$

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۶) $\lim_{x\to 4} \dfrac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} = \dfrac{0}{0}$ مبهم رفع $\lim_{x\to 4} \dfrac{\sqrt{3x+4}-4}{\underbrace{\sqrt[3]{5x+7}-3}_{\text{مزدوج}}} \times \dfrac{\sqrt{3x+4}+4}{\sqrt{3x+4}+4} \times \dfrac{\sqrt[3]{(5x+7)^2}+3\sqrt[3]{5x+7}+9}{\sqrt[3]{(5x+7)^2}+3\sqrt[3]{5x+7}+9}$

$= \lim_{x\to 4} \dfrac{(3x+4-16)(\sqrt[3]{(5x+7)^2}+3\sqrt[3]{5x+7}+9)}{(5x+7-27)(\sqrt{3x+4}+4)} = \dfrac{3\times 27}{5\times 8} = \dfrac{81}{40} = 2.025$ ۴

$3(\cancel{x-4})$, $5(\cancel{x-4})$

Arman

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۷) $\lim\limits_{x\to 1} \dfrac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1} = \dfrac{0}{0}$ ابهام $\Rightarrow \lim\limits_{x\to 1} \dfrac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1} \times \dfrac{\sqrt{3x+\sqrt{x}}+2}{\sqrt{3x+\sqrt{x}}+2} \times \dfrac{\sqrt[3]{x^2}+1+\sqrt[3]{x}}{\sqrt[3]{x^2}+1+\sqrt[3]{x}}$

اتحاد جمله مشترک $\leftarrow (\cancel{\sqrt{x}-1})(3\sqrt{x}+4)$

$= \lim\limits_{x\to 1} \dfrac{(\cancel{3x+\sqrt{x}-4})(\sqrt[3]{x^2}+1+\sqrt[3]{x})}{(\cancel{x-1})(\sqrt{3x+\sqrt{x}}+2)} = \dfrac{(3+4)(3)}{(2)(4)} = \dfrac{21}{8}$

$(\cancel{\sqrt{x}-1})(\sqrt{x}+1)$

۸) $\lim\limits_{x\to \pi} \dfrac{1+\cos^3 x}{\sin^2 x} = \dfrac{0}{0}$ ابهام $\Rightarrow \lim\limits_{x\to\pi} \dfrac{\cancel{(1+\cos x)}(\cos^2 x+1-\cos x)}{\cancel{(1-\cos^2 x)}(1-\cos x)\cancel{(1+\cos x)}}$

$= \dfrac{1+1+1}{1-(-1)} = \dfrac{3}{2}$

۹) $\lim\limits_{x\to \pi/4} \dfrac{1-\tan x}{\sin x-\cos x} = \dfrac{0}{0}$ ابهام $\Rightarrow \lim\limits_{x\to\pi/4} \dfrac{\frac{\cancel{\cos x-\sin x}}{\cos x}}{-(\cancel{\cos x-\sin x})} = \lim\limits_{x\to\pi/4} -\dfrac{1}{\cos x}$

$= -\dfrac{1}{\sqrt{2}/2} = -\dfrac{2}{\sqrt{2}} = -\sqrt{2}$

۱۰) $\lim\limits_{x\to \frac{3\pi}{4}} \dfrac{\tan^2 x-1}{\cos 2x} = \dfrac{0}{0}$ ابهام $\Rightarrow \lim\limits_{x\to\frac{3\pi}{4}} \dfrac{\frac{\cancel{\sin^2 x-\cos^2 x}}{\sin^2 x}}{-(\cancel{\sin^2 x-\cos^2 x})} = \lim\limits_{x\to\frac{3\pi}{4}} -\dfrac{1}{\sin^2 x}$

$= -\dfrac{1}{(\sqrt{2}/2)^2} = -2$