Subject: (آرالادینی - یازدهم ریاضی) تکلیف ۲۵ Date:

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

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۲) $x\to 0^+ : \dfrac{3x-1-4x-1}{x} = \dfrac{-2}{0^+} = -\infty$

در $x=0$ حد ندارد

$x\to 0^- : \dfrac{1-3x+4x+1}{x} = \dfrac{2}{0^-} = -\infty$

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۳) $\lim\limits_{x\to 4} \dfrac{x-4}{\sqrt{x}-2} = \dfrac{0}{0}$ مبهم رفع $\lim\limits_{x\to 4} \dfrac{(\sqrt{x}-2)(\sqrt{x}+2)}{\sqrt{x}-2} = \sqrt{4}+2 = 4$

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

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

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

$= \lim\limits_{x\to 1} \dfrac{(1-x)(2+\sqrt{5-x})}{(1+\sqrt{x})(4-5+x)} = \dfrac{4}{-2} = -2$

$-(1-x)$

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۶) $\lim\limits_{x\to 4} \dfrac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} = \dfrac{0}{0}$ مبهم رفع $\lim\limits_{x\to 4} \dfrac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} \times \dfrac{\sqrt{3x+4}+4}{\sqrt{3x+4}+4} \times \dfrac{\sqrt[3]{(5x+7)^2}+3\sqrt[3]{5x+7}+9}{\sqrt[3]{(5x+7)^2}+3\sqrt[3]{5x+7}+9}$

مزدوج

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

$3(x-4)$ ، $5(x-4)$

Arman

Subject : ( ) Date :

۷) $\lim_{x\to 1} \frac{\sqrt{x+\sqrt{x}}-2}{\sqrt[3]{x}-1} = \frac{0}{0}$ مبهم $\Rightarrow \lim_{x\to 1} \frac{\sqrt{x+\sqrt{x}}-2}{\sqrt[3]{x}-1} \times \frac{\sqrt{x+\sqrt{x}}+2}{\sqrt{x+\sqrt{x}}+2} \times \frac{\sqrt[3]{x^2}+1+\sqrt[3]{x}}{\sqrt[3]{x^2}+1+\sqrt[3]{x}}$

$\lim_{x\to 1} \frac{(\sqrt{x}-1)(\sqrt{x}+2)}{(\sqrt[3]{x}-1)(\sqrt[3]{x^2}+1+\sqrt[3]{x})} \times \frac{(\sqrt[3]{x^2}+1+\sqrt[3]{x})}{(\sqrt{x+\sqrt{x}}+2)}$ ← اتحاد جم مشترک

$= \lim_{x\to 1} \frac{(\sqrt{x}-1)(\sqrt{x}+2)}{(\sqrt{x}-1)(\sqrt{x}+1)} \times \frac{(3)(3)}{(2)(4)} = \frac{9}{8}$

۸) $\lim_{x\to\pi} \frac{1+\cos^3 x}{\sin^2 x} = \frac{0}{0}$ مبهم $\Rightarrow \lim_{x\to\pi} \frac{(1+\cos x)(\cos^2 x+1-\cos x)}{(1-\cos^2 x)(1-\cos x)}$

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

۹) $\lim_{x\to\pi/4} \frac{1-\tan x}{\sin x-\cos x} = \frac{0}{0}$ مبهم $\Rightarrow \lim_{x\to\pi/4} \frac{\frac{\cos x-\sin x}{\cos x}}{-(\cos x-\sin x)} \Rightarrow \lim_{x\to\pi/4} -\frac{1}{\cos x}$

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

۱۰) $\lim_{x\to\frac{\pi}{4}} \frac{\tan^2 x-1}{\cos 2x} = \frac{0}{0}$ مبهم $\Rightarrow \lim_{x\to\frac{\pi}{4}} \frac{\frac{\sin^2 x-\cos^2 x}{\sin^2 x}}{-(\sin^2 x-\cos^2 x)} \Rightarrow \lim_{x\to\frac{\pi}{4}} -\frac{1}{\sin^2 x}$

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