پریا امینی

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$$\lim_{x\to 1} \frac{4x^2-7x+3}{5x^2-8x+3} \xrightarrow[\text{رفع ابهام}]{\frac{0}{0}} \lim \frac{(4x-3)\cancel{(x-1)}}{(5x-3)\cancel{(x-1)}} = \frac{1}{2}$$

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$\frac{0}{0}$ مبهم

$$\lim_{x\to 0} \frac{|3x-1|-|3x+1|}{x} = \lim_{x\to 0} \frac{-3x+1-3x-1}{x} = \frac{-6x}{x} = -6$$

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$$\lim_{x\to 4} \frac{x-4}{\sqrt{x}-2} \xrightarrow[\text{رفع ابهام}]{\frac{0}{0}} \lim_{x\to 4} \frac{\cancel{(\sqrt{x}-2)}(\sqrt{x}+2)}{\cancel{\sqrt{x}-2}} = \lim_{x\to 4}(\sqrt{x}+2) = 2+2=4$$

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$$\lim_{x\to 2} \frac{x-\sqrt{2x}}{2x^2-x-6} \xrightarrow[\text{رفع ابهام}]{\frac{0}{0}} \lim_{x\to 2} \frac{\sqrt{x}(\sqrt{x}-\sqrt{2})}{(2x+3)(x-2)} = \lim_{x\to 2} \frac{\sqrt{x}\cancel{(\sqrt{x}-\sqrt{2})}}{(2x+3)\cancel{(\sqrt{x}-\sqrt{2})}(\sqrt{x}+\sqrt{2})} = \frac{\sqrt{2}}{7(2\sqrt{2})} = \frac{\sqrt{2}}{14\sqrt{2}} = \frac{1}{14}$$

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$$\lim_{x\to 1}\frac{1-\sqrt{x}}{2-\sqrt{5-x}} \xrightarrow[\text{رفع ابهام}]{\frac{0}{0}} \lim_{x\to 1}\frac{1-\sqrt{x}}{2-\sqrt{5-x}}\times\frac{2+\sqrt{5-x}}{2+\sqrt{5-x}} = \lim_{x\to 1}\frac{\cancel{1-\sqrt{x}}}{\underbrace{4-5+x}_{-(1-x)=-(\cancel{1-\sqrt{x}})(1+\sqrt{x})}}\times 4 = \frac{1}{-2}\times 4 = -2$$

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$$\lim_{x\to 4}\frac{\overbrace{\sqrt{3x+4}-4}^{\text{مبهم}}}{\sqrt[3]{5x+7}-3}\times\frac{\sqrt{3x+4}+4}{\sqrt{3x+4}+4}\times\frac{\sqrt[3]{(5x+7)^2}+9+3\sqrt[3]{5x+7}}{\sqrt[3]{(5x+7)^2}+9+3\sqrt[3]{5x+7}} = \lim_{x\to 4}\frac{\overbrace{3x+4-16}^{\substack{3(\cancel{x-4})\\ 3x-12}}}{\underbrace{5x+7-27}_{\substack{5x-20\\ 5(\cancel{x-4})}}}\times\frac{27}{8} = \frac{3}{5}\times\frac{27}{8} =$$

$$\frac{81}{40} = 2.025$$

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$$\lim_{x\to 1}\frac{\overbrace{\sqrt{3x+\sqrt{x}}-2}^{\text{مبهم}}}{\sqrt[3]{x}-1}\times\frac{\sqrt{3x+\sqrt{x}}+2}{\sqrt{3x+\sqrt{x}}+2}\times\frac{\sqrt[3]{x^2}+\sqrt[3]{x}+1}{\sqrt[3]{x^2}+\sqrt[3]{x}+1} = \lim_{x\to 1}\frac{\overbrace{3x+\sqrt{x}-4}^{(3\sqrt{x}+4)(\cancel{\sqrt{x}-1})}}{\underbrace{x-1}_{(\cancel{\sqrt{x}-1})(\sqrt{x}+1)}}\times\frac{3}{4} = \frac{7}{2}\times\frac{3}{4} = \frac{21}{8}$$

$$3x+\sqrt{x}-4 \xrightarrow{\sqrt{x}=t} 3t^2+t-4 = (t-1)(3t+4) \xrightarrow{\sqrt{x}=t} (\sqrt{x}-1)(3\sqrt{x}+4)$$

$$\begin{array}{l|l} 3t^2+t-4 & t-1 \\ \cline{2-2} -3t^2+3t & 3t+4 \\ \cline{1-1} 4t-4 & \\ -4t+4 & \\ \cline{1-1} 0 & \end{array}$$

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$$\lim_{x\to \pi}\frac{\overbrace{1+\cos^3 x}^{\text{مبهم}}}{\underset{1-\cos^2 x}{\sin^2 x}} = \lim_{x\to \pi}\frac{(\cancel{1+\cos x})(1-\cos x+\cos^2 x)}{(1-\cos x)(\cancel{1+\cos x})} = \frac{3}{2}$$

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$$\lim_{x\to \frac{\pi}{4}}\frac{\overbrace{1-\tan x}^{\text{مبهم}}}{\sin x-\cos x} \quad 1-\tan x \to \frac{\cos x}{\cos x}-\frac{\sin x}{\cos x}$$

$$\longrightarrow \lim_{x\to \frac{\pi}{4}}\frac{\frac{\cancel{\cos x-\sin x}}{\cos x}}{\frac{-(\cancel{\cos x-\sin x})}{1}} = \lim_{x\to \frac{\pi}{4}}\frac{1}{-\cos x} = \frac{\frac{1}{1}}{\frac{-\sqrt{2}}{2}} = \frac{2}{-\sqrt{2}} = -\sqrt{2}$$

دریا امینی

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$$\lim_{x\to\frac{۳\pi}{۴}} \frac{\tan^۲ x-1}{\cos ۲x} = \lim_{x\to\frac{۳\pi}{۴}} \frac{\frac{-\cancel{(1-\tan^۲ x)}}{1}}{\frac{\cancel{1-\tan^۲ x}}{1+\tan^۲ x}} = \lim_{x\to\frac{۳\pi}{۴}} \frac{-1-\tan^۲ x}{1} = \boxed{-۲}$$

$$\cos ۲x = \frac{1-\tan^۲ x}{1+\tan^۲ x}$$

$$\tan\frac{۳\pi}{۴} = \tan\left(\pi-\frac{\pi}{۴}\right) = -\tan\frac{\pi}{۴} = -1$$