نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس .....

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$$\lim_{x\to 1} \frac{x^2-7x+12}{5x^2-8x+3} \to \frac{(x-3)(x-4)}{(x-1)(5x-3)} \to \frac{(x-3)(x-4)}{(x-1)(5x-3)} \Rightarrow \lim_{x\to 1} \frac{x-4}{5x-3} = \frac{1}{2}$$

$$\begin{array}{r|l} 5x^2-8x+3 & x-1 \\ -5x^2+5x & 5x-3 \\ \hline -3x+3 & \\ 3x-3 & \\ \hline 0 & \end{array}$$

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$$\frac{-x^3-x-1}{x} = \frac{-2}{x} = -\infty \quad (0^+)$$

$$\frac{-x^3-x-1}{x} = \frac{-6x}{x} = -6 \quad (0^-)$$

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

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$$\lim_{x\to 2} \frac{x-\sqrt{2x}}{x^2-x-6} \times \frac{x+\sqrt{2x}}{x+\sqrt{2x}} \Rightarrow \frac{x^2-2x}{(x-3)(x+2)(x+\sqrt{2x})} = \frac{x}{(x+3)(x+\sqrt{2x})} = \frac{1}{8}$$

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

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

$$= \frac{3(x-3)}{3(x-3)^3} \times \frac{8}{6} = \frac{8}{(x-3)^2} \times \frac{1}{6} = \frac{4}{3(x-3)^2}$$

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$$\lim_{x\to 1} \frac{\sqrt{3x+\sqrt{2x+3}}-2}{\sqrt[3]{x}+x-2} \times \frac{\text{مزدوج صورت}}{\text{مزدوج صورت}} \times \frac{\text{مزدوج مخرج}}{\text{مزدوج مخرج}} = \frac{3x+\sqrt{x+3}-4}{x-1} \times \frac{3}{4}$$

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

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$$\lim_{u\to 0} \frac{(1+\cos x)(1+\cos^2 x-\cos x)}{1-\cos^3 x} = \frac{2}{3} = \frac{1+1-1}{3} = \frac{1}{3}$$

$$1-\cos^3 x = (1-\cos x)(1+\cos x+\cos^2 x)$$

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

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$$\lim_{x\to \frac{\pi}{4}} \frac{\frac{\sin^2\alpha}{\cos^2\alpha}-\frac{\cos^2\alpha}{\cos^2\alpha}}{\cos 4\alpha} = \frac{\frac{\sin^2\alpha-\cos^2\alpha}{\cos^2\alpha}}{\cos 4\alpha} = \frac{-1}{\cos^2\alpha} = \frac{-1}{\frac{1}{2}+\frac{1}{2}} = -2$$

$$\cos 2\alpha = \cos^2\alpha-\sin^2\alpha$$