۱۴,۵

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

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

$\to \frac{(x-\frac{3}{2})(x-1)}{(5x-3)(x-1)} \Rightarrow \lim_{x\to 1} \frac{2x-3}{5x-3} = \frac{1}{2}$

$5x^2-8x+3 \;\big|\; x-1$

$5x^2-5x \quad\quad 5x-3$

$-3x+3$

$-3x+3$

0

۲

$\frac{|x^3-1|-x^3-1}{x}$

$0^+ \to \frac{x^3-1-x^3-1}{x} = \frac{-2}{x} = -\infty$

$0^- \to \frac{-x^3+1-x^3-1}{x} = \frac{-2x^3}{x} = -2$

۳

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

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$\lim_{x\to 2} \frac{x-\sqrt{2x}}{2x^2-x-6} \times \frac{x+\sqrt{2x}}{x+\sqrt{2x}} \Rightarrow \frac{x^2-2x}{(2x+3)(x-2)(x+\sqrt{2x})} = \frac{x}{(2x+3)(x+\sqrt{2x})} = \frac{1}{7}$

$\lim \to \frac{1-\frac{2}{\sqrt{2x}}}{4x-1} = \frac{1}{14}$

۵

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

۶

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

$$= \frac{3(x-3)}{3x} \times \frac{4+4+4}{3+3} = \frac{x-3}{x} \times \frac{12}{6} = \frac{2(x-3)}{x}$$

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۷

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

$$\frac{3x+\sqrt{2x+3}-4}{x-1} \to \frac{3(x-1)+(\sqrt{2x+3}-\sqrt{5})}{x-1} \to \frac{3(x-1)+\frac{2(x-1)}{\sqrt{2x+3}+\sqrt{5}}}{x-1} \to 3+\frac{2}{\sqrt{5}+\sqrt{5}} = 3+\frac{1}{2\sqrt{5}} = \frac{13}{4}$$

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۸

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

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

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۹

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

۱,۵

۱۰

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

۵

۸) مرحله اول $\to \lim_{u\to 1} \frac{\sqrt{3u+\sqrt{3u}}-2}{u-1} \times \frac{\sqrt{3u+\sqrt{3u}}+2}{\sqrt[3]{u^2}+1+\sqrt[3]{u}} \times \frac{3}{3}$

مرحله دوم $\to \frac{3}{4} \times \frac{1+\frac{1}{2\sqrt{3}}}{1} = \frac{3}{4} \times \frac{7}{6} = \frac{21}{8}$