امیر محمدوجاتی

۱۸٫۷۵

B بازخورد

کلاس ۳۶

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(۲) $\lim_{x\to 1} \frac{4x^2-7x+3}{5x^2-8x+3} \xrightarrow{H.O.P} \frac{8x-7}{10x-8} \to \frac{1}{2}$ ✓

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

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(۲) $\lim_{x\to 4} \frac{x-4}{\sqrt{x}-2} \xrightarrow{\text{مزدوج}} \frac{0}{0} \to \times \frac{\sqrt{x}+2}{\sqrt{x}+2} = \frac{(x-4)(\sqrt{x}+2)}{x-4} = 4$ ✓

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(۱٫۵) $\lim_{x\to 9} \frac{x-\sqrt{3x}}{2x^2-x-45} = \frac{0}{0} \to \times \frac{x+\sqrt{3x}}{x+\sqrt{3x}} = \frac{x^2-3x}{2x^2-x-45\times x+\sqrt{3x}} \Rightarrow \frac{x(x-3)}{(2x+9)(x-5)(x+\sqrt{3x})}$

$\frac{x-3}{(2x+9)(x-5)(x+\sqrt{3x})} \to \frac{6}{18\times 14\times 6} = \frac{1}{42}$

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(۲) $\lim_{x\to 1} \frac{1-\sqrt{x}}{2-\sqrt{5-x}} = \frac{0}{0} \to \times \frac{1+\sqrt{x}}{1+\sqrt{x}} \times \frac{2+\sqrt{5-x}}{2+\sqrt{5-x}} \Rightarrow \frac{1-x}{4-(5-x)} \times \frac{2+\sqrt{5-x}}{1+\sqrt{x}} \to \frac{(1-x)(2+\sqrt{5-x})}{(x-1)(1+\sqrt{x})} = -2$ ✓

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(۲) $\lim_{x\to 3} \frac{\sqrt[3]{x^2+3x}-3}{2\sqrt{5x+7}-8} \xrightarrow{\text{مزدوج}} \frac{0}{0} \to \times \frac{\sqrt[3]{(x+5)^2}+3\sqrt[3]{x+5}+9}{\sqrt[3]{(x+5)^2}+3\sqrt[3]{x+5}+9} \times \frac{2\sqrt{5x+7}+8}{2\sqrt{5x+7}+8} \to \frac{(x-3)(2\sqrt{5x+7}+8)}{(x-3)(\sqrt[3]{(x+5)^2}+3\sqrt[3]{x+5}+9)} = \frac{16}{27}$ ✓

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(۲) $\lim_{x\to 1} \frac{\sqrt{x^2+3x}-2}{\sqrt[3]{x}-1} \times \frac{\sqrt{x^2+3x}+2}{\sqrt{x^2+3x}+2} \times \frac{\sqrt[3]{x^2}+\sqrt[3]{x}+1}{\sqrt[3]{x^2}+\sqrt[3]{x}+1} \Rightarrow \frac{(x-1)(x+4)(\sqrt[3]{x^2}+\sqrt[3]{x}+1)}{(\sqrt[3]{x}-1)(\sqrt{x^2+3x}+2)} \to \frac{(x-1)(x+4)(\sqrt[3]{x^2}+\sqrt[3]{x}+1)}{(\sqrt[3]{x}-1)(\sqrt[3]{x^2}+\sqrt[3]{x}+1)(\sqrt{x^2+3x}+2)}$

$\frac{5\times 3}{2+2} = \frac{15}{8}$ ✓

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(۱٫۷۵) $\lim_{x\to 0} \frac{1+\cos^2 3x}{\sin^2 x} \to \frac{2}{0} \to \frac{(1+\cos 3x)(1+\cos^2 3x-\cos 3x+1)}{1-\cos^2 3x} \to \frac{(1-\cos x)(1+\cos x)}{(1-\cos x)(1+\cos x)}$

$= \frac{9}{2}$

امثلة و مراجعة

$$\lim_{x \to \frac{\pi}{4}} \frac{1-\tan x}{\sin x - \cos x} \Rightarrow \frac{0}{0} \rightarrow \frac{1-\frac{\sin x}{\cos x}}{\sin x - \cos x} \Rightarrow \frac{\frac{\cos x - \sin x}{\cos x}}{\sin x - \cos x} = \frac{-1}{\cos x} \Rightarrow \frac{-1}{\frac{\sqrt{2}}{2}} = -\sqrt{2}$$

1,V5

$$\lim_{x \to \frac{\pi}{4}} \frac{\tan^2 x - 1}{\cos 2x} \rightarrow \frac{(\tan x - 1)(\tan x + 1)}{\cos^2 x - \sin^2 x} \rightarrow \frac{\sin x - \cos x}{\cos x} \times \frac{\sin x + \cos x}{\cos x} \Big/ (\cos x - \sin x)(\cos x + \sin x) = \frac{-1}{\cos^2 x}$$

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

1,V5

$$\text{Hop} \rightarrow \lim_{x \to 1} \frac{1 - \frac{1}{\sqrt{x}}}{4x - 1} = \frac{\frac{1}{2}}{7} = \frac{1}{14}$$

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