عسل طاهری

سوال ۱ ←

$$\lim_{x\to 1} \frac{4x^2-7x+3}{3x^2-8x+5} = \frac{0}{0} \xrightarrow{\text{مزدوج}} \frac{(x-1)(4x-3)}{(x-1)(3x-5)}$$

$$\lim_{x=1} \frac{4x-3}{3x-5} \to \boxed{\frac{1}{2}}$$

سوال ۲ ←

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

$0^+ \to \frac{-(3x-1)-(1+3x)}{x} = \boxed{-6}$

$0^- \to \frac{-(3x-1)-(1+3x)}{x} = \boxed{6}$

سوال ۳ ←

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

سوال ۴ ←

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

$$\to \frac{x(x-2)}{(x-2)(2x+3)(x+\sqrt{2x})} = \frac{x}{(2x+3)(x+\sqrt{2x})} = \frac{2}{(7)(4)} = \frac{1}{14}$$

سوال ۵ ←

$$\lim_{x\to 1} \frac{x-1}{3-\sqrt{x+8}} \times \frac{3+\sqrt{x+8}}{3+\sqrt{x+8}} \times \frac{3+\sqrt{x+8}}{x+1}$$

$$\to \frac{(x-1)(3+\sqrt{x+8})}{(x+1)} = \frac{(0)(6)}{(2)} = \boxed{-2}$$

سوال ۶ ←

$$\lim_{x\to 3} \frac{\sqrt{3x+7}-4}{\sqrt[3]{5x+7}-2} \to \frac{(3x+7)-16}{(5x+7)-8} \to \frac{3(x-3)}{5(x-3)} \to \boxed{\frac{3}{5}}$$

سوال ۷

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

$$\rightarrow \frac{3x+\sqrt{x}-8}{x-1} \times \frac{\sqrt[3]{(3x+\sqrt{x})^2}+\sqrt[3]{3x+\sqrt{x}}+1}{\sqrt{3x+\sqrt{x}}+2} = \frac{(\sqrt{x}+\frac{8}{3})(\sqrt{x}-1)}{x-1}$$

$$\rightarrow \frac{3}{4} \times \frac{\frac{7}{3}}{\sqrt{x}+1} \rightarrow \frac{7}{4} \times \frac{1}{2} \rightarrow \frac{7}{8}$$

سوال ۸

$$\lim_{x\to\pi} \frac{1+\cos^3 x}{\sin^2 x} \rightarrow \frac{(1+\cos x)(\cos^2 x+1-\cos x)}{\sin^2 x}$$

$$\rightarrow \frac{(1+\cos x)(\cos^2 x+1-\cos x)}{(1-\cos x)(1+\cos x)} \rightarrow \frac{\cos^2 x+1-\cos x}{1-\cos x}$$

$$\rightarrow \boxed{\frac{3}{2}}$$

سوال ۹

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

سوال ۱۰

$$\lim_{x\to\frac{3}{4}\pi} \frac{\tan^2 x-1}{\cos 2x} = \frac{(\tan x+1)(\tan x-1)}{-(\sin^2 x-\cos^2 x)} \rightarrow \frac{\sin^2 x-\cos^2 x}{\cos^2 x} \times \frac{}{-\sin x+\cos^2 x}$$

$$\rightarrow -\frac{1}{\cos^2 x} \rightarrow -\frac{1}{\frac{1}{2}} = \boxed{-2}$$