

آرادیکی مالی یازدیک سیر A

سوال ۱
 $\lim_{x \rightarrow 1} \frac{5x^2 - 7x + 3}{8x^2 - 11x + 3} \xrightarrow{\text{HOP}} \frac{1 \cdot 1 - 7}{1 \cdot 1 - 1} \xrightarrow{x=1} \frac{1}{2}$

سوال ۲
 $\lim_{x \rightarrow 0} \frac{|x^n - 1| - |x^{n+1}|}{x} \begin{cases} 0^+ & \frac{-x^n + 1 - x^{n+1} - 1}{x} = \frac{-x^n}{x} = -x \\ 0^- & \frac{-x^n + 1 - x^{n+1} - 1}{x} = \frac{-x^n}{x} = -x \end{cases} \rightarrow (-x)$

سوال ۳
 $\lim_{x \rightarrow \infty} \frac{x - \varepsilon}{\sqrt{x} - 2} \times \frac{x + \varepsilon}{\sqrt{x} + 2} \rightarrow \frac{(x - \varepsilon)(x + \varepsilon)}{x - \varepsilon} = \varepsilon$

سوال ۴
 $\lim_{x \rightarrow 2} \frac{x - \sqrt{2x}}{2x^2 - x - 4} \times \frac{x + \sqrt{2x}}{x + \sqrt{2x}} \rightarrow \frac{x^2 - 2x}{(2x+3)(x-2)(2x)} = \frac{1}{\varepsilon x + 4} \xrightarrow{x=2} \frac{1}{14}$

سوال ۵
 $\lim_{x \rightarrow 1} \frac{1 - \sqrt{x}}{2 - \sqrt{8-x}} \times \frac{1 + \sqrt{x}}{1 + \sqrt{x}} \times \frac{1 - x}{1 - x} = \frac{1 - x}{\varepsilon \delta + 2x} \times \frac{\varepsilon}{2} = -1 \times 2 = (-2)$

سوال ۶
 $\lim_{x \rightarrow \infty} \frac{\sqrt{2x+5} - \varepsilon}{\sqrt[3]{8x+6} - 2} \times \frac{\sqrt{2x+5} + \varepsilon}{\sqrt{2x+5} + \varepsilon} \times \frac{x}{x} = \frac{2}{\delta} \times \frac{2}{1} = \frac{4}{\varepsilon}$

سوال ۷
 $\lim_{x \rightarrow 1} \frac{\sqrt{x+1} - 2}{\sqrt{x} - 1} \times \frac{1}{\varepsilon} \times \frac{\varepsilon}{\delta} = \frac{2x + \sqrt{x} - \varepsilon}{x - 1} \times \frac{1}{\varepsilon} = \frac{(2x - 2) + \sqrt{x} - 1}{x - 1} \times \frac{1}{\varepsilon} = \frac{2(\cancel{x-1}) + \frac{(x-1)}{\sqrt{x+1}}}{x-1} \times \frac{1}{\varepsilon} = \frac{2}{\varepsilon} \times \frac{1}{1} = \frac{2}{\varepsilon}$

$$\Delta \text{ JW} \\ \lim_{\alpha \rightarrow \pi} \frac{1 + \cos^2 \alpha}{1 - \cos^2 \alpha} = \frac{(1 + \cos \alpha)(1 - \cos \alpha + \cos^2 \alpha)}{(1 - \cos \alpha)(1 + \cos \alpha)} = \frac{\cos^2 \alpha - \cos \alpha + 1}{1 - \cos \alpha} \xrightarrow{\alpha = \pi} \frac{1 + 1}{1} = \frac{2}{1} = \frac{2}{1}$$

$$\text{JW} \\ \lim_{\alpha \rightarrow \frac{\pi}{2}} \frac{1 - \tan \alpha}{\sin \alpha - \cos \alpha} = \frac{1 - \frac{\sin \alpha}{\cos \alpha}}{\sin \alpha - \cos \alpha} = \frac{\frac{\cos \alpha - \sin \alpha}{\cos \alpha}}{\sin \alpha - \cos \alpha} = \frac{-1}{\cos \alpha} \xrightarrow{\alpha = \frac{\pi}{2}} -\sqrt{2}$$

$$\text{JW} \\ \lim_{\alpha \rightarrow \frac{\pi}{2}} \frac{\tan \alpha - 1}{\cos \alpha} = \frac{\frac{\sin \alpha - \cos \alpha}{\cos \alpha}}{\cos \alpha - \sin \alpha} = \frac{-1}{\cos \alpha} \Rightarrow -\sqrt{2}$$