آزاد نیک‌سعالمی یازدهم تجربی A

۲۵

سوال یک (۲)

$$\lim_{x\to 1}\frac{4x^2-7x+3}{5x^2-8x+3}\ \xrightarrow[\frac{0}{0}]{Hop}\ \frac{8x-7}{10x-8}\ \xrightarrow{x=1}\ \frac{1}{2}$$

سوال دو (۲)

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

$$0^+:\ \frac{-3x+1-3x-1}{x}=\frac{-6x}{x}=-6$$

$$0^-:\ \frac{-3x+1-3x-1}{x}=\frac{-6x}{x}=-6$$

$$\rightarrow -6$$

سوال ۳ (۲)

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

سوال چهار (۲)

$$\lim_{x\to 2}\frac{x-\sqrt{2x}}{2x^2-x-6}\times\frac{x+\sqrt{2x}}{x+\sqrt{2x}}\ \longrightarrow\ \frac{x^2-2x}{(2x+3)(x-2)(2x)}=\frac{x(x-2)}{(2x+3)(x-2)(2x)}=\frac{1}{4x+6}\ \xrightarrow{x=2}\ \frac{1}{14}$$

$\frac{0}{0}$

سوال پنج (۲)

مزدوج

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

سوال شش (۲)

$$\lim_{x\to 4}\frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3}\times\frac{\sqrt{3x+4}+4}{\sqrt{3x+4}+4}\times\frac{\sqrt[3]{(5x+7)^2}+3\sqrt[3]{5x+7}+9}{\sqrt[3]{(5x+7)^2}+3\sqrt[3]{5x+7}+9}=\frac{3}{5}\times\frac{27}{8}=\frac{81}{40}$$

سوال هفت (۲)

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

$$=\frac{3}{4}\times\frac{7}{2}=\frac{21}{8}$$

۵ مسئله

$$\lim_{x \to \pi} \frac{1+\cos^3 x}{\sin^2 x \,/\, 1-\cos^2 x} = \frac{(1+\cos x)(1-\cos x+\cos^2 x)}{(1-\cos x)(1+\cos x)} = \frac{\cos^2 x - \cos x + 1}{1-\cos x} \xrightarrow{x=\pi} \frac{1+1+1}{2} = \frac{3}{2}$$ ✓ (۲)

۶ مسئله

$$\lim_{x \to \frac{\pi}{6}} \frac{1-\tan x}{\sin x - \cos x} = \frac{1-\frac{\sin x}{\cos x}}{} = \frac{\frac{\cos x - \sin x}{\cos x}}{\sin x - \cos x} = \frac{-1}{\cos x} \xrightarrow{x=\frac{\pi}{6}} -\sqrt{2}$$ ✓ (۲)

(-1 above the fraction)

۱۰ مسئله

$$\lim_{x \to \frac{3\pi}{4}} \frac{\tan^2 x - 1}{\cos^2 x} = \frac{\frac{\sin^2 x - \cos^2 x}{\cos^2 x}}{\cos^2 x - \sin^2 x} = \frac{-1}{\cos^2 x} \xrightarrow{x=\frac{3\pi}{4}} -2$$ ✓ (۲)

(-1 above the fraction)