

باران شرفی - تلف سوس سوام

سوال ۱:  $\lim_{x \rightarrow 1} \frac{x^2 - 5x + 3}{x^2 - 1x + 3} = \frac{0}{0} = \frac{(x-1)(x-3)}{(x-1)(5x-3)} = \frac{x-3}{5x-3} = \frac{1-3}{5-3} = \frac{-2}{2} = -1$

①  $\frac{f'(x) = 2x - 5}{f(x) = -1x + 3}$   $\rightarrow$   $\frac{2x-5}{-x+3}$

سوال ۲:  $\lim_{x \rightarrow 0} \frac{|3x-1| - |3x+1|}{x} = \frac{-1-1-3x-1}{x} = \frac{-3-3x}{x} = \frac{-3}{x} = -\frac{3}{x}$

سوال ۳:  $\lim_{x \rightarrow 4} \frac{x-4}{\sqrt{x}-2} = \frac{(x-2)(x+2)}{(\sqrt{x}-2)} = \sqrt{x+2} = 2+2 = 4$

سوال ۴:  $\lim_{x \rightarrow 2} \frac{x-\sqrt{x}}{x^2-x-4} = \frac{x-\sqrt{x}}{(x-2)(x+3)}$

$\lim_{x \rightarrow 2} \frac{1-\sqrt{x}}{x-\sqrt{x}} = \frac{1-\sqrt{x}}{x-\sqrt{x}} \rightarrow \frac{1-\sqrt{x}}{x-\sqrt{x}}$

سوال ۵:  $\lim_{x \rightarrow 4} \frac{\sqrt{3x+2}-2}{\sqrt{5x+1}-3} = \frac{3x+2-4}{5x+1-9} = \frac{3x-2}{5x-8}$

سوال ۶:  $\lim_{x \rightarrow 1} \frac{\sqrt{3x+2}-2}{\sqrt{x}-1} = \frac{3x+2-4}{x-1} = \frac{3x-2}{x-1} = \frac{(3x-14)(x-1)}{(x-1)} = \frac{-14x+13}{-1} = \frac{14x-13}{1} = 1$

سوال ۷:  $\lim_{x \rightarrow \pi} \frac{1+\cos x}{\sin x} = \frac{(1+\cos x)(1+\cos x)}{\sin x} = \frac{1-\cos^2 x}{\sin x} = \frac{(1-\cos x)(1+\cos x)}{\sin x}$

$\frac{1+(-1)^2 - (-1)^2}{1-(-1)} = \frac{1-1}{2} = \frac{0}{2} = 0$

$$\lim_{x \rightarrow \frac{\pi}{4}} \frac{1 - \tan x}{\sin x - \cos x} = \frac{1 - \frac{\sin x}{\cos x}}{\sin x - \cos x} = \frac{\cos x - \sin x}{\sin x - \cos x} \quad \text{: 9 سوال}$$

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

$$\lim_{x \rightarrow \frac{\pi}{4}} \frac{\tan x - 1}{\cos x} = \frac{\frac{\sin x}{\cos x} - 1}{\cos x - \sin x} = \frac{\sin x - \cos x}{\cos x (\cos x - \sin x)} \quad \text{: 10 سوال}$$

$$= \frac{1}{\cos x} = \frac{1}{\frac{\sqrt{2}}{2}} = \frac{2}{\sqrt{2}} = \sqrt{2}$$

$$= \frac{1}{\left(\frac{\sqrt{2}}{2}\right)^2} = \frac{1}{\frac{2}{4}} = \frac{1}{\frac{1}{2}} = 2$$