

سوال (۱)

$$\lim_{x \rightarrow 1} \frac{4x^2 - 7x + 3}{2x^2 - 1x + 3} = \frac{0}{0} \text{ رفع ابهام, } \frac{(x-1)(4x-3)}{(x-1)(2x-3)} = \frac{4x-3}{2x-3} \xrightarrow{x \rightarrow 1} \frac{1}{2}$$

سوال (۲)

$$\lim_{x \rightarrow 0} \frac{|3x-1| - |3x+1|}{x} = \frac{0}{0} \text{ رفع ابهام, } \begin{cases} \xrightarrow{0^+} \frac{1-3x-3x-1}{x} = \frac{-4x}{x} = -4 \\ \xrightarrow{0^-} \frac{1-3x-3x-1}{x} = \frac{-4x}{x} = -4 \end{cases}$$

سوال (۳)

$$\lim_{x \rightarrow 4} \frac{x-4}{\sqrt{x}-2} = \frac{0}{0} \text{ رفع ابهام, } \frac{x-4}{\sqrt{x}-2} \times \frac{\sqrt{x}+2}{\sqrt{x}+2} = \frac{x-4(\sqrt{x}+2)}{x-4} = \sqrt{x}+2 \xrightarrow{x \rightarrow 4} \sqrt{4}+2 = 4$$

سوال (۴)

$$\lim_{x \rightarrow 2} \frac{x-\sqrt{2x}}{2x^2-x-4} = \frac{0}{0} \text{ رفع ابهام, } \frac{x-\sqrt{2x}}{(x-2)(2x+3)} \times \frac{x+2}{x+2} = \frac{x^2-2x}{(x-2)(2x+3)(x+2)} = \frac{x}{(2x+3)(x+2)} \xrightarrow{x \rightarrow 2} \frac{2}{14} = \frac{1}{7}$$

سوال (۵)

$$\lim_{x \rightarrow 1} \frac{1-\sqrt{x}}{2-\sqrt{2-x}} = \frac{0}{0} \text{ رفع ابهام, } \frac{1-\sqrt{x}}{2-\sqrt{2-x}} \times \frac{1+\sqrt{x}}{1+\sqrt{x}} \times \frac{2+\sqrt{2-x}}{2+\sqrt{2-x}} = \frac{(1-x)(2+\sqrt{2-x})}{(2-x)(1+\sqrt{x})(2+\sqrt{2-x})} = \frac{2+\sqrt{2-x}}{-(1+\sqrt{x})(2-x)} = \frac{2+\sqrt{2-x}}{-(1+x)(1-x)} = \frac{2+\sqrt{2-x}}{-(1-x)^2} = -2$$

سوال (۶)

$$\lim_{x \rightarrow 4} \frac{\sqrt{3x+4} - 4}{\sqrt{2x+6} - 2} = \frac{0}{0} \text{ رفع ابهام, } \frac{\sqrt{3x+4} - 4}{\sqrt{2x+6} - 2} \times \frac{\sqrt{3x+4} + 4}{\sqrt{3x+4} + 4} \times \frac{2}{2} = \frac{3x+4-16}{(2x+6-2)(\sqrt{3x+4}+4)} \times \frac{2}{2} = \frac{3x-12}{(2x+4)(\sqrt{3x+4}+4)} = \frac{3(x-4)}{2(x+2)(\sqrt{3x+4}+4)} = \frac{3(\sqrt{3x+4}+4)}{2(\sqrt{3x+4}+4)} = \frac{3}{2} = \frac{11}{10}$$

سوال (۷)

$$\lim_{x \rightarrow 1} \frac{\sqrt{3x+5} - 2}{\sqrt{x} - 1} = \frac{0}{0} \text{ رفع ابهام, } \frac{\sqrt{3x+5} - 2}{\sqrt{x} - 1} \times \frac{\sqrt{3x+5} + 2}{\sqrt{3x+5} + 2} \times \frac{1}{1} = \frac{3x+5-4}{(x-1)(\sqrt{3x+5}+2)} = \frac{3x+1}{(x-1)(\sqrt{3x+5}+2)} = \frac{(\sqrt{x}-1)(\sqrt{3x}+1)}{(\sqrt{x}+1)(\sqrt{x}-1)(\sqrt{3x+5}+2)} = \frac{\sqrt{x}+1}{\sqrt{x}+1} = 1$$

$$\lim_{x \rightarrow \pi} \frac{1 + \cos^2 x}{\sin^2 x} = \frac{0}{0} \xrightarrow{\text{رنج ایام}} \frac{(1 + \cos x)(1 - \cos x + \cos^2 x)}{(1 - \cos x)(1 + \cos x)} = \frac{1 - \cos x + \cos^2 x}{1 - \cos x} \stackrel{x \rightarrow \pi}{=} \frac{\pi}{2}$$

سوال (1) 5

$$\lim_{x \rightarrow \frac{\pi}{4}} \frac{1 - \tan x}{\sin x - \cos x} = \frac{0}{0} \xrightarrow{\text{رنج ایام}} \frac{1 - \frac{\sin x}{\cos x}}{\sin x - \cos x} = \frac{\frac{\cos x - \sin x}{\cos x}}{\sin x - \cos x} = \frac{-1}{\cos x} \stackrel{x \rightarrow \frac{\pi}{4}}{=} -\sqrt{2}$$

سوال (9) 5

$$\lim_{x \rightarrow \frac{\pi}{4}} \frac{\tan^2 x - 1}{\cos^2 x} = \frac{0}{0} \xrightarrow{\text{رنج ایام}} \frac{\frac{\sin^2 x}{\cos^2 x} - 1}{\cos^2 x - \sin^2 x} = \frac{\frac{\sin^2 x - \cos^2 x}{\cos^2 x}}{\cos^2 x - \sin^2 x} = \frac{-1}{\cos^2 x} \stackrel{x \rightarrow \frac{\pi}{4}}{=} -2$$

سوال (1) 5