سوال ①

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

سوال ②

$$\lim_{x\to 0}\frac{|1-3x|+|3x+1|}{x}=\frac{0}{0}\longrightarrow\frac{1-3x-1-3x}{x}=\frac{-6x}{x}=-6$$

سوال ③

$$\lim_{x\to 4}\frac{x-4}{2-\sqrt{x}}=\frac{0}{0}\longrightarrow\frac{x-4}{2-\sqrt{x}}\times\frac{2+\sqrt{x}}{2+\sqrt{x}}=\frac{(x-4)(2+\sqrt{x})}{(4-x)}=-4$$

سوال ④

$$\lim_{x\to 2}\frac{x-\sqrt{3x-2}}{2x^2-x-6}=\frac{0}{0}\longrightarrow\frac{x-\sqrt{3x-2}}{2x^2-x-6}\times\frac{x+\sqrt{3x-2}}{x+\sqrt{3x-2}}=\frac{x^2-3x+2}{(2x^2-x-6)(x+\sqrt{3x-2})}=\frac{(x-2)(x-1)}{(2x+3)(x-2)(x+\sqrt{3x-2})}=\frac{1}{7\times 4}=\frac{1}{28}$$

سوال ⑤

$$\lim_{x\to 1}\frac{1-\sqrt{x}}{2-\sqrt{3x+1}}=\frac{0}{0}\longrightarrow\frac{1-\sqrt{x}}{2-\sqrt{3x+1}}\times\frac{1+\sqrt{x}}{1+\sqrt{x}}\times\frac{2+\sqrt{3x+1}}{2+\sqrt{3x+1}}=\frac{(-1)(x-1)(4)}{(3x+1-4)(2)}=-2$$

سوال ۶

$$\lim_{x\to 3}\frac{\sqrt{2x+3}-3}{\sqrt[3]{5x+2}-3}=\frac{0}{0}\longrightarrow \frac{\sqrt{2x+3}-3}{\sqrt[3]{5x+2}-3}\times\frac{\sqrt{2x+3}+3}{\sqrt{2x+3}+3}\times\frac{\sqrt[3]{(5x+2)^2}+3\sqrt[3]{5x+2}+9}{\sqrt[3]{(5x+2)^2}+3\sqrt[3]{5x+2}+9}=\frac{(2x-6)(x+3)}{(5x-15)(1)}=\frac{2(x-3)\times 3}{5(x-3)\times 1}=\frac{6}{5}$$

سوال ۷

$$\lim_{x\to 1}\frac{\sqrt{2x+\sqrt{x}}-2}{\sqrt[3]{x}-1}=\frac{0}{0}\longrightarrow \frac{\sqrt{2x+\sqrt{x}}-2}{\sqrt[3]{x}-1}\times\frac{\sqrt{2x+\sqrt{x}}+2}{\sqrt{2x+\sqrt{x}}+2}\times\frac{\sqrt[3]{x^2}+\sqrt[3]{x}+1}{\sqrt[3]{x^2}+\sqrt[3]{x}+1}=\frac{(2x+\sqrt{x}-4)(3)}{(x-1)(4)}=\frac{(\sqrt{x}+4)(2\sqrt{x}-1)(3)}{(\sqrt{x}-1)(\sqrt{x}+1)(4)}=\frac{21}{8}$$

سوال ۸

$$\lim_{x\to\pi}\frac{1+\cos^3 x}{\sin^4 x}=\frac{0}{0}\longrightarrow \frac{(1+\cos x)(1-\cos x+\cos^2 x)}{(1-\cos^2 x)(1-\cos x)(1+\cos x)}=\frac{3}{2}$$

سوال ۹

$$\lim_{x\to\frac{\pi}{4}}\frac{1-\tan x}{\sin x-\cos x}=\frac{0}{0}\longrightarrow \frac{1-\frac{\sin x}{\cos x}}{\sin x-\cos x}=\frac{(\cos x-\sin x)^{-1}}{\cos x(\sin x-\cos x)}=\frac{-1}{\cos x}=\frac{-2}{\sqrt{2}}=-\frac{2\sqrt{2}}{2}=-\sqrt{2}$$

سوال ۱۰

$$\lim_{x\to\frac{\pi}{4}}\frac{\tan^2 x-1}{\cos 2x}=\frac{0}{0}\longrightarrow \frac{\frac{\sin^2 x}{\cos^2 x}-1}{\cos^2 x-\sin^2 x}=\frac{\frac{\sin^2 x-\cos^2 x}{\cos^2 x}}{\cos^2 x-\sin^2 x}=\frac{-1}{\cos^2 x}=\frac{-1}{\frac{1}{2}}=-2$$