سید علی اکبر ...

۱-

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

۲-

$$\lim_{x\to 0} \frac{|2x-1| - |2x+1|}{x} = \frac{0}{0} \Rightarrow \frac{1-2x - (2x+1)}{x} = \frac{1-2x-2x-1}{x} = \frac{-4x}{x} = \boxed{-4}$$

۳-

$$\lim_{x\to 4} \frac{x-4}{\sqrt{x}-2} = \frac{0}{0} \Rightarrow \dots \Rightarrow hop = \frac{1}{\frac{1}{2\sqrt{x}}} = \boxed{4}$$

۴-

$$\lim_{x\to 2} \frac{x-\sqrt{2x}}{2x^2-x-6} = \frac{0}{0} \xrightarrow{hop} \frac{1-\frac{2}{2\sqrt{2x}}}{4x-1} = \frac{\frac{1}{2}}{7} = \frac{1}{14}$$

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

۵-

$$\lim_{x\to 1} \frac{1-\sqrt{x}}{2-\sqrt{5-x}} = \frac{0}{0} \Rightarrow hop = \frac{\frac{-1}{2\sqrt{x}}}{+\frac{1}{2\sqrt{5-x}}} = \frac{-\frac{1}{2}}{\frac{1}{4}} = \boxed{-2}$$

$$\frac{1-\sqrt{x}}{2-\sqrt{5-x}}\cdot\frac{(1+\sqrt{x})}{2}\times\frac{4}{2+\sqrt{5-x}} = \frac{1-x}{4-5+x}\times 2 = \frac{1-x}{x-1}\times 2 = \boxed{-2}$$

۶-

$$\lim_{x\to 4} \frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} = \frac{0}{0} \xrightarrow{h=1} \frac{\frac{3}{2\sqrt{3x+4}}}{\frac{5}{3\sqrt[3]{(5x+7)^2}}} = \frac{\frac{3}{2\times 4}}{\frac{5}{9\times 3}} = \frac{\frac{3}{8}}{\frac{5}{27}} = \boxed{\frac{27\times 3}{40}}$$

سهیل خزان آسا

۷-

$$\lim_{x\to 1} \frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1} = \frac{0}{0} \quad \frac{3+\frac{1}{2\sqrt{x}}}{2\sqrt{3x+\sqrt{x}}} = \frac{\frac{3/5}{4}}{\frac{1}{3}} = \frac{3\times 3/5}{4} = \frac{10/5}{4}$$

(دوم) $= \frac{3x+\sqrt{x}-4}{x-1} \times \frac{3}{4} = \frac{(\sqrt{x}-1)(3\sqrt{x}+4)}{(x-1)\sqrt{x}+1} = \frac{7}{2}\times\frac{3}{4} = \frac{21}{8}$

۸-

$$\lim_{x\to \pi} \frac{1+\cos^3 x}{\sin^2} = \frac{0}{0} \Rightarrow \frac{1+\cos^3 x}{1-\cos^2 x} =$$

$\cos x = t$

$$\lim_{t\to -1} \frac{1+t^3}{1-t^2} \Rightarrow \frac{3t^2}{-2t} = \frac{3}{2} = \frac{(1+\cos)(\cos^2-\cos+1)}{(1+\cos)(1-\cos)} = \frac{\cos^2-\cos+1}{1-\cos} = \frac{3}{2} = 1/5$$

۹-

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

۱۰-

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

$$\frac{\frac{\sin^2-\cos^2}{\cos^2}}{\frac{2\cos^2 x-1}{1}} = \frac{\sin^2-\cos^2}{\cos^2(2\cos^2-1)} =$$

$$\frac{1-\cos^2-\cos^2}{\cos^2(2\cos^2-1)} = \frac{1-2\cos^2}{2\cos^4-\cos^2} =$$

$\cos = t$

$$\lim_{t\to -\frac{\sqrt{2}}{2}} \frac{1-2t^2}{2t^4-t^2} = \frac{-4t}{8t^3-2t} = \frac{-4t}{4t-2t} = \frac{-4t}{2t} = -2$$

راه حل ۲

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