اکبر صفرنیا

۱- $\lim\limits_{x\to 1}\frac{4x^2-7x+3}{5x^2-8x+3}$ $\xrightarrow{\text{ضرایب برابر}}$ با $x=1$ بر بخش پذیر است $\frac{\cancel{(x-1)}(4x-3)}{\cancel{(x-1)}(5x-3)} = \frac{4(1)-3}{5(1)-3} = \boxed{\frac{1}{2}}$

۲- $\lim\limits_{x\to 0}\frac{|3x-1|-|3x+1|}{x} = \frac{0}{0} \Rightarrow \begin{cases} 0^+ & \frac{3x-1-3x+1}{x} = \frac{-6\cancel{x}}{\cancel{x}} \\ 0^- & \frac{3x-1-3x+1}{x} = \frac{-6\cancel{x}}{\cancel{x}} \end{cases}$

$= -6$

۳- $\lim\limits_{x\to 4}\frac{x-4}{\sqrt{x}-2} = \frac{0}{0} \Rightarrow \frac{\cancel{(\sqrt{x}-2)}(\sqrt{x}+2)}{\cancel{\sqrt{x}-2}} = \sqrt{4}+2 = 4$

۴- $\lim\limits_{x\to 2}\frac{x-\sqrt{2x}}{2x^2-x-6} = \frac{0}{0} \Rightarrow \times\frac{\cancel{م}}{م} = \frac{x^2-2x}{2x^2-x-6}\times\frac{1}{4} =$

$\frac{x\cancel{(x-2)}}{\cancel{(x-2)}(2x+3)4} = \frac{2}{28} = \boxed{\frac{1}{14}}$

۵- $\lim\limits_{x\to 1}\frac{1-\sqrt{x}}{2-\sqrt{5-x}} = \frac{0}{0} \Rightarrow \times\frac{\cancel{م}}{م}\times\frac{م}{\cancel{م}} = \frac{1-x}{4-5+x}^{\,-1}\times\frac{4}{2} = -2$

۶- $\lim\limits_{x\to 4}\frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} = \frac{0}{0} \Rightarrow \times\frac{\cancel{م}}{م}\times\frac{ف}{\cancel{ف}} = \frac{3x+4-16}{5x+7-27}\times\frac{27}{8}$

$= \frac{3\cancel{(x-4)}}{5\cancel{(x-4)}}\times\frac{27}{8} = \boxed{\frac{81}{40}}$

۷- $\lim\limits_{x\to 1}\frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1} = \frac{0}{0}\times\frac{\cancel{م}}{م}\times\frac{ف}{\cancel{ف}} = \frac{3x+\sqrt{x}-4}{x-1}\times\frac{3}{4}$

$= \frac{3x-3+\sqrt{x}-1}{x-1}\times\frac{3}{4} = \frac{3(\sqrt{x}-1)(\sqrt{x}+1)+\sqrt{x}-1}{(\sqrt{x}-1)(\sqrt{x}+1)}$

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

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۸ـ $$\lim_{x\to\pi}\frac{1+\cos^3 x}{\sin^2 x}=\frac{0}{0}\Rightarrow\frac{\cancel{(1+\cos x)}(1+\cos^2 x-\cos x)}{\cancel{(1+\cos x)}(1-\cos x)}=\boxed{\frac{3}{2}}$$

۹ـ $$\lim_{x\to\frac{\pi}{4}}\frac{1-\tan x}{\sin x-\cos x}=\frac{0}{0}\Rightarrow\frac{\frac{\cancel{\cos x-\sin x}}{\cos x}}{\cancel{\sin x-\cos x}}-1=\frac{-1}{\cos x}=\frac{-1}{\frac{\sqrt{2}}{2}}$$
$$=-\sqrt{2}$$

۱۰ـ $$\lim_{x\to\frac{3\pi}{4}}\frac{\tan^2 x-1}{\cos 2x}=\frac{0}{0}\Rightarrow\frac{\frac{\cancel{\sin^2 x-\cos^2 x}}{\cos^2 x}}{\cancel{\cos^2 x-\sin^2 x}}-1=\frac{-1}{\cos^2 x}=\frac{-1}{\frac{2}{4}}$$
$$=-2$$

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