شایان صبحی

① $\lim\limits_{x\to 1} \frac{4x^2-7x+3}{5x^2-8x+3} \xrightarrow{\text{تجزیه}} \frac{(4x-3)\cancel{(x-1)}}{\cancel{(x-1)}(5x-3)} = \frac{1}{2}$

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② $\lim\limits_{x\to 0} \frac{|3x-1|-|2x+1|}{x} \xrightarrow{0} \frac{-2x+1-2x-1}{x} = -4$

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③ $\lim\limits_{x\to 4} \frac{x-4}{\sqrt{x}-2} \Rightarrow \frac{\cancel{(\sqrt{x}-2)}(\sqrt{x}+2)}{\cancel{(\sqrt{x}-2)}} = 4$

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④ $\lim\limits_{x\to 2} \frac{x-\sqrt{2x}}{2x^2-x-6} = \frac{x-\sqrt{2x}}{(x-2)(2x+3)} = \frac{\sqrt{x}\,\cancel{(\sqrt{x}-\sqrt{2})}}{(2x+3)(\sqrt{x}+\sqrt{2})\cancel{(\sqrt{x}-\sqrt{2})}}$

تجزیه

مزدوج

$\frac{\cancel{\sqrt{2}}}{2\cancel{\sqrt{2}}\cdot 7} = \boxed{\frac{1}{14}}$

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⑤ $\lim\limits_{x\to 1} \frac{1-\sqrt{x}}{2-\sqrt{5-x}} \Rightarrow \times \frac{1+\sqrt{x}}{1+\sqrt{x}} \Rightarrow \times \frac{2+\sqrt{5-x}}{2+\sqrt{5-x}}$

$\Rightarrow \frac{(1-x)\,4}{2(-1+x)} = -2$

حاصل $\frac{0}{0}$

$1-\sqrt{x}=0$ در $1+\sqrt{x}$ برابر است با ۲، ضرب

$2-\sqrt{5-x}=0$

در

$2=\sqrt{5-x}$

⑥ $\lim_{x\to ۴} \frac{\sqrt{۳x+۴}-۴}{\boxed{\sqrt[۳]{۵x+۷}-۳}} \times \frac{\sqrt{۳x+۴}+۴}{\underset{(۸)}{\boxed{\sqrt{۳x+۴}+۴}}}$ حان صفر

$$\times \frac{\overset{(۲۷)}{\boxed{\sqrt[۳]{(۵x+۷)^۲}+۹+۳\sqrt[۳]{۵x+۷}}}}{\sqrt[۳]{(۵x+۷)^۲}+۹+۳\sqrt[۳]{۵x+۷}}$$

$$\Rightarrow \frac{\overset{۳\cancel{(x-۴)}}{۳x-۱۲}}{\underset{۵\cancel{(x-۴)}}{۵x-۲۰}} \times \frac{۲۷}{۸} \Rightarrow \boxed{\frac{۸۱}{۴۰}}$$ ✓

$\sqrt[۳]{۵x+۷}=۳$, $\sqrt{۳x+۴}=۴ \Longleftarrow$ ـا $\frac{۰}{۰}$ ۵ . ها

⑦ $\lim_{x\to ۱} \frac{\sqrt{۳x+\sqrt{x}}-۲}{\sqrt[۳]{x}-۱} \times \frac{\sqrt{۳x+\sqrt{x}}+۲}{\underset{(۴)}{\boxed{\sqrt{۳x+\sqrt{x}}+۲}}}$

$$\times \frac{\overset{(۳)}{\boxed{\sqrt[۳]{x^۲}+۱+\sqrt[۳]{x}}}}{\sqrt[۳]{x^۲}+۱+\sqrt[۳]{x}}$$

$$\Rightarrow \frac{۳x+\sqrt{x}-۴}{x-۱} \times \frac{۳}{۴}$$

$$\Rightarrow \frac{(\sqrt{x}-۱)(۳\sqrt{x}+۴)}{(\sqrt{x}+۱)(\sqrt{x}-۱)} \times \frac{۳}{۴} \Rightarrow \boxed{\frac{۲۱}{۸}}$$

صفحه ۵۰

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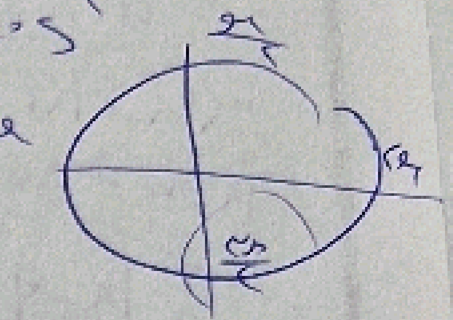
$$\lim_{x\to\pi} \frac{1+\cos^3 x}{\sin^2 x} \to \frac{1+\cos^3 x}{1-\cos^2}$$

$$\Rightarrow \frac{\cancel{(1+\cos)}(1+\cos^2-\cos)}{(1-\cos)\cancel{(1+\cos)}} \Rightarrow \frac{1+1+1}{2} = 1.5$$



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$$\lim_{x\to\frac{\pi}{4}} \frac{1-\tan x}{\sin x-\cos x} \Rightarrow \frac{1-\frac{\sin}{\cos}}{\sin-\cos} \Rightarrow \frac{\frac{\overset{-1}{\cancel{\cos-\sin}}}{\cos}}{\frac{\cancel{-(\cos-\sin)}}{1}}$$

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

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$$\lim_{x\to\frac{3\pi}{4}} \frac{\tan^2-1}{\cos 2x} \Rightarrow \frac{\frac{\sin^2-\cos^2}{\cos^2}}{\cos^2 x-\sin^2 x}$$

$$\frac{3\pi}{4}$$

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$$\frac{\frac{(\overset{-1}{\cancel{\sin-\cos}})\cancel{(\sin+\cos)}}{\cos^2}}{\cancel{(\cos-\sin)}\cancel{(\cos+\sin)}} \Rightarrow \frac{-1}{\cos^2 x} = \frac{-1}{\frac{1}{2}} = \boxed{-2}$$