نیایش شاه نظری ۱۸ تکلیف کد ۳۰ یازدهم دهم

① ۲

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

$$\lim_{x\to 1}\frac{4x-3}{5x-3}=\boxed{\frac{1}{2}}$$

② $\lim\limits_{x\to 0} \dfrac{|3x-1|-|3x+1|}{x} = \lim\limits_{x\to 0} \dfrac{1-3x-(3x+1)}{x} = \lim\limits_{x\to 0} \dfrac{-6\cancel{x}}{\cancel{x}} = \boxed{-6}$

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

④ $\lim\limits_{x\to 2} \dfrac{x-\sqrt{2x}}{2x^2-x-6} \times \dfrac{x+\sqrt{2x}}{x+\sqrt{2x}} = \lim\limits_{x\to 2} \dfrac{x^2-2x}{2x^2-x-6\,(x+\sqrt{2x})} =$

$\lim\limits_{x\to 2} \dfrac{x\cancel{(x-2)}}{\cancel{(x-2)}(2x+3)(x+\sqrt{2x})} = \lim\limits_{x\to 2} \dfrac{x}{(2x+3)(x+\sqrt{2x})} = \dfrac{2}{7\times 4} = \boxed{\dfrac{1}{14}}$

⑤ $\lim\limits_{x\to 1} \dfrac{1-\sqrt{x}}{2-\sqrt{5-x}} \times \dfrac{1+\sqrt{x}}{1+\sqrt{x}} \times \dfrac{2+\sqrt{5-x}}{2+\sqrt{5-x}} = \lim\limits_{x\to 1} \dfrac{\overset{-1}{\cancel{(1-x)}}(2+\sqrt{5-x})}{\cancel{(x-1)}(\sqrt{x}+1)}$

$\lim\limits_{x\to 1} \dfrac{-1(2+\sqrt{5-x})}{\sqrt{x}+1} = \dfrac{-4}{2} = \boxed{-2}$

⑥ $\lim\limits_{x\to 4} \dfrac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} \times \dfrac{\sqrt{3x+4}+4}{\sqrt{3x+4}+4} \times \dfrac{\sqrt[3]{(5x+7)^2}+9+3\sqrt[3]{5x+7}}{\sqrt[3]{(5x+7)^2}+9+3\sqrt[3]{5x+7}} =$

$\lim\limits_{x\to 4} \dfrac{(3x-12)(9+3\sqrt[3]{5x+7}+\sqrt[3]{(5x+7)^2})}{(5x-20)\,(\sqrt{3x+4}+4)} = \dfrac{27\times 3\cancel{(x-4)}}{8\times 5\cancel{(x-4)}} = \boxed{\dfrac{81}{40}}$

⑦ $\lim\limits_{x\to 1} \dfrac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1} \times \dfrac{\sqrt{3x+\sqrt{x}}+2}{\sqrt{3x+\sqrt{x}}+2} \times \dfrac{1+\sqrt[3]{x}+\sqrt[3]{x^2}}{1+\sqrt[3]{x}+\sqrt[3]{x^2}} =$

تاریخ: / /

موضوع:

صحیح با ۳م $\rightarrow \lim_{x\to 1} \dfrac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1} \times \dfrac{\sqrt{3x+\sqrt{x}}+2}{\sqrt[3]{x^2}+1+\sqrt[3]{x}} \times \dfrac{3}{4}$

$\xrightarrow{HOP} \dfrac{3}{4} \times \dfrac{3+\frac{1}{2\sqrt{x}}}{1} = \dfrac{3}{4}\times\dfrac{7}{2} = \dfrac{21}{8}$

$$\lim_{x\to 1} \frac{(3x+\sqrt{x}-4)(1+\sqrt[3]{x}+\sqrt[3]{x^2})}{(x-1)(\sqrt{3x+\sqrt{x}}+2)} = \boxed{\frac{3}{4}}$$

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

$1-\cos x$

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$$\lim_{x\to\pi} \frac{\cos^2 x-\cos x+1}{\cos x-1} = \frac{3}{-2} = \boxed{-1.5}$$

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

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$$\lim_{x\to\frac{\pi}{4}} \frac{-1}{\cos x} = \frac{-1}{\frac{\sqrt{2}}{2}} = \frac{-2}{\sqrt{2}} = \boxed{-\sqrt{2}}$$

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$$\lim_{x\to\frac{3\pi}{4}} \frac{\tan^2 x-1}{\cos 2x} = \frac{(\tan x+1)(\tan x-1)}{\cos^2 x-\sin^2 x} = \frac{\cancel{\frac{\sin x+\cos x}{\cos x}} \times \overset{-1}{\cancel{\frac{\sin x-\cos x}{\cos x}}}}{\cancel{(\cos x+\sin x)}\cancel{(\cos x-\sin x)}}$$

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$$\lim_{x\to\frac{3\pi}{4}} \frac{-1}{\cos^2 x} = \frac{-1}{\left(-\frac{\sqrt{2}}{2}\right)^2} = \frac{-1}{\frac{1}{2}} = \boxed{-2}$$