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ترانه طاهریان - تکلیف ۲۳ - یازدهم دختر c

۱-

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

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

۲-

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

$$\hookrightarrow\ 3x-1<0$$

۳-

$$\lim_{x\to 4}\frac{x-4}{\sqrt{x}-2}=\frac{0}{0}\xrightarrow{\text{رفع ابهام}}\frac{\cancel{(\sqrt{x}-2)}(\sqrt{x}+2)}{\cancel{\sqrt{x}-2}}=\sqrt{x}+2$$

$$=2+2=4$$

۴-

$$\lim_{x\to 2}\frac{x-\sqrt{2x}}{2x^2-x-6}=\frac{0}{0}\xrightarrow{\text{رفع ابهام}}\frac{\sqrt{x}(\sqrt{x}-\sqrt{2})}{(x-2)(2x+3)}$$

$$=\frac{\sqrt{x}\cancel{(\sqrt{x}-\sqrt{2})}}{\cancel{(\sqrt{x}-\sqrt{2})}(\sqrt{x}+\sqrt{2})(2x+3)}=\frac{\sqrt{x}}{(\sqrt{x}+\sqrt{2})(2x+3)}$$

$$=\frac{\cancel{\sqrt{2}}}{(2\cancel{\sqrt{2}})\times(2\times 2+3)}=\frac{1}{14}$$

۵-

$$\lim_{x\to 1}\frac{1-\sqrt{x}}{2-\sqrt{5-x}}=\frac{0}{0}\xrightarrow{\text{رفع ابهام}}\frac{1-\sqrt{x}}{2-\sqrt{5-x}}\times\frac{1+\sqrt{x}}{1+\sqrt{x}}\times\frac{2+\sqrt{5-x}}{2+\sqrt{5-x}}$$

Scubo

$$= \frac{\overset{-1}{\cancel{(1-x)}}\,\overset{\to 4}{(2+\sqrt{5-x})}}{\cancel{(x-1)}\,\underset{\hookrightarrow 2}{(1+\sqrt{x})}} = \frac{-4}{2} = -2$$

-۶

$$\lim_{x\to 4} \frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} = \frac{0}{0} \xrightarrow{\text{رفع ابهام}}$$

$$\frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} \times \frac{\sqrt{3x+4}+4}{\sqrt{3x+4}+4} \times \frac{\sqrt[3]{(5x+7)^2}+3\sqrt[3]{5x+7}+9}{\sqrt[3]{(5x+7)^2}+3\sqrt[3]{5x+7}+9}$$

$$= \frac{\overset{3}{\cancel{(3x-12)}}\left(\sqrt[3]{(5x+7)^2}+3\sqrt[3]{5x+7}+9\right)}{\underset{5}{\cancel{(5x-20)}}\left(\sqrt{3x+4}+4\right)} = \frac{3}{5} \times \frac{27}{8} = \frac{81}{40}$$

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$$\lim_{x\to 1} \frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1} = \frac{0}{0} \xrightarrow{\text{رفع ابهام}}$$

$$\frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1} \times \frac{\sqrt[3]{x^2}+1+\sqrt[3]{x}}{\sqrt[3]{x^2}+1+\sqrt[3]{x}} \times \frac{\sqrt{3x+\sqrt{x}}+2}{\sqrt{3x+\sqrt{x}}+2} =$$

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

$$= \frac{(3\sqrt{x}+4)(\sqrt[3]{x^2}+\sqrt[3]{x}+1)}{(\sqrt{x}+1)(\sqrt{3x+\sqrt{x}}+2)} = \frac{7\times 3}{2\times 4} = \frac{21}{8}$$

۸- $\lim_{x\to\pi} \dfrac{1+\cos^3 x}{\sin^2 x} = \dfrac{0}{0}$ $\xrightarrow{\text{رفع ابهام}}$ $(\sin^2 x = 1-\cos^2 x)$

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

۹- $\lim_{x\to\frac{\pi}{4}} \dfrac{1-\tan x}{\sin x - \cos x} = \dfrac{0}{0}$ $\xrightarrow{\text{رفع ابهام}}$ $\dfrac{\dfrac{\cos x}{\cos x} - \dfrac{\sin x}{\cos x}}{\sin x - \cos x}$

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

۱۰- $\lim_{x\to\frac{3\pi}{4}} \dfrac{\tan^2 x - 1}{\cos 2x} = \dfrac{0}{0}$ $\xrightarrow{\text{رفع ابهام}}$ $\left(\tan^2\alpha = \dfrac{1-\cos 2\alpha}{1+\cos 2\alpha}\right)$

$$\frac{\dfrac{1-\cos 2x - 1 - \cos 2x}{1+\cos 2x}}{\cos 2x} = \frac{\dfrac{-2\cancel{\cos 2x}}{1+\cos 2x}}{\cancel{\cos 2x}} =$$

$$\frac{-2}{1+\underbrace{\cos 2x}_{0}} = -2$$