مهدی کاظمی یازدهم پسر B

(۱)

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

$\frac{0}{0}$ رفع ابهام

(۲)

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

$3x-1<0$

$\frac{0}{0}$ رفع ابهام

(۳)

$$\lim_{x\to 4}\frac{x-4}{\sqrt{x}-2}\longrightarrow\frac{\cancel{(\sqrt{x}-2)}(\sqrt{x}+2)}{\cancel{(\sqrt{x}-2)}}=4$$

$\frac{0}{0}$ رفع ابهام

(۴)

$$\lim\frac{x-\sqrt{2x}}{2x^2-x-6}\xrightarrow{hop}\frac{1-\frac{1\times 2}{2\sqrt{2x}}}{4x-1}\longrightarrow\frac{1-\frac{2}{4}}{7}=\frac{1}{14}$$

(۵)

$$\lim_{x\to 1}\frac{1-\sqrt{x}}{2-\sqrt{5-x}}\xrightarrow{hop}\frac{+\left(\frac{1}{2\sqrt{x}}\right)}{+\left(\frac{-1}{2\sqrt{5-x}}\right)}=\frac{\frac{1}{2}}{-\frac{1}{4}}=-2$$

(۶)

$$\lim_{x\to 4}\frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3}\quad\frac{3x+4-16}{5x+7-27}\times\frac{27}{8}=\frac{3x-12}{5x-20}\times\frac{27}{8}=$$

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

مهدی کاظمی پسر B

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$$\lim_{x\to 1} \frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1} = \frac{3x+\sqrt{x}-4}{x-1} \times \frac{3}{4} =$$

$$\longrightarrow \frac{3x-3+\sqrt{x}-1}{x-1} \times \frac{3}{4} \longrightarrow \left(3 + \frac{\sqrt{x}-1}{x-1}\right) \times \frac{3}{4} = \left(3 + \frac{\sqrt{x}-1}{(\sqrt{x}-1)(\sqrt{x}+1)}\right) \times \frac{3}{4} = \frac{21}{8}$$

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

$$\longrightarrow \frac{1-(-1)+(-1)^2}{1-(-1)} = \frac{3}{2}$$

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

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