نام و نام خانوادگی ...علی صفری... پاسخنامه تشریحی تکلیف شماره ۳۰ ... کلاس یازدهم [illegible]...

۲۰

۱ (۲)

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

یا

$$\lim_{x\to 1}\frac{4x^2-7x+3}{5x^2-8x+3}=\frac{0}{0}\xrightarrow{hop}\lim_{x\to 1}\frac{8x-7}{10x-8}=\frac{1}{2}$$

۲ (۲)

$$\lim_{x\to 0}\frac{|3x-1|-|3x+1|}{x}=\frac{0}{0}\underset{\text{تعیین علامت درون قدرمطلق}}{=}\lim_{x\to 0}\frac{(-3x+1)-(3x+1)}{x}=\lim_{x\to 0}\frac{-6x}{x}=-6$$

$$\begin{array}{c|c} & \frac{1}{3} \\ \hline - & + \end{array}\qquad\begin{array}{c|c} & -\frac{1}{3} \\ \hline - & + \end{array}$$

۳ (۲)

$$\lim_{x\to 4}\frac{x-4}{\sqrt{x}-2}=\frac{0}{0}=\lim_{x\to 4}\frac{(\sqrt{x}-2)(\sqrt{x}+2)}{(\sqrt{x}-2)}=4$$

یا

$$\lim_{x\to 4}\frac{x-4}{\sqrt{x}-2}=\frac{0}{0}\xrightarrow{hop}\lim_{x\to 4}\frac{1}{\frac{1}{2\sqrt{x}}}=4$$

۴ (۲)

$$\lim_{x\to 2}\frac{x-\sqrt{2x}}{2x^2-x-6}=\frac{0}{0}=\lim_{x\to 2}\frac{x^2-2x}{(x-2)(2x+3)\underbrace{(x+\sqrt{2x})}_{4}}=\lim_{x\to 2}\frac{x(x-2)}{(x-2)(2x+3)(4)}$$

$$=\lim_{x\to 2}\frac{x}{(2x+3)(4)}=\frac{2}{28}$$

۵ (۲)

$$\lim_{x\to 1}\frac{1-\sqrt{x}}{2-\sqrt{5-x}}=\frac{0}{0}=\lim_{x\to 1}\frac{1-x}{4-5+x}\times\frac{4}{2}=-2$$

یا

$$\lim_{x\to 1}\frac{1-\sqrt{x}}{2-\sqrt{5-x}}=\frac{0}{0}\xrightarrow{hop}\lim_{x\to 1}\frac{-\frac{1}{2\sqrt{x}}}{-\frac{-1}{2\sqrt{5-x}}}=\frac{-\frac{1}{2}}{\frac{1}{4}}=-2$$

$$\lim_{x\to 4}\frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3}=\frac{0}{0}=\lim_{x\to 4}\frac{3x+4-16}{5x+7-27}\times\frac{27}{8}=\frac{81}{40}$$

2

6

$$\lim_{x\to 1}\frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1}=\frac{0}{0}=\lim_{x\to 1}\frac{3x+\sqrt{x}-4}{x-1}\times\frac{3}{4}=\lim_{x\to 1}\frac{(3x-3)+(\sqrt{x}-1)}{(\sqrt{x}-1)(\sqrt{x}+1)}\times\frac{3}{4}$$

2

$$=\lim_{x\to 1}\frac{\cancel{(\sqrt{x}-1)}\big(3(\sqrt{x}+1)+1\big)}{\cancel{(\sqrt{x}-1)}(\sqrt{x}+1)}\times\frac{3}{4}=\frac{21}{8}$$

7

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

2

8

$$\lim_{x\to\frac{\pi}{4}}\frac{1-\tan x}{\sin x-\cos x}=\frac{0}{0}=\lim_{x\to\frac{\pi}{4}}\frac{1-\tan^2 x}{\sin^2 x-\cos^2 x}\times\frac{\sin x+\cos x}{2}=\lim_{x\to\frac{\pi}{4}}\frac{1-\tan^2 x}{-\cos 2x}\times\frac{\sin x+\cos x}{2}$$

2

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

یا

$$\lim_{x\to\frac{\pi}{4}}\frac{1-\tan x}{\sin x-\cos x}=\frac{0}{0}\xrightarrow{hop}\lim_{x\to\frac{\pi}{4}}\frac{-(1+\tan^2 x)}{\cos x+\sin x}=\frac{-2}{\sqrt{2}}=-\sqrt{2}$$

9

$$\lim_{x\to\frac{3\pi}{4}}\frac{\tan^2 x-1}{\cos 2x}=\frac{0}{0}\xrightarrow{hop}\lim_{x\to\frac{3\pi}{4}}\frac{2\tan x(1+\tan^2 x)}{-2\sin 2x}=\lim_{x\to\frac{3\pi}{4}}\frac{2(1+\tan^2 x)}{-4\cos^2 x}=\frac{4}{-2}=-2$$

2

یا

10

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