درسا صادق زاده - یازدهم دختر A

$$\lim_{x\to ۱}\frac{۴x^۲-۷x+۳}{۵x^۲-۸x+۳}=\frac{۰}{۰}\xrightarrow{\text{رفع ابهام}}\frac{\cancel{(x-۱)}(۴x-۳)}{\cancel{(x-۱)}(۵x-۳)}=\frac{۱}{۲}$$

$$\begin{array}{l|l} ۴x^۲-۷x+۳ & x-۱ \\ \hline -۴x^۲+۴x & ۴x-۳ \\ -۳x+۳ & \\ +۳x-۳ & \\ \hline ۰ & \end{array}
\qquad
\begin{array}{l|l} ۵x^۲-۸x+۳ & x-۱ \\ \hline -۵x^۲+۵x & ۵x-۳ \\ -۳x+۳ & \\ \hline ۰ & \end{array}$$

$$\lim_{x\to ۰}\frac{|۳x-۱|-|۳x+۱|}{x}=\frac{۰}{۰}\xrightarrow{\text{رفع ابهام}}\frac{-۳x+\cancel{۱}-۳x-\cancel{۱}}{x}=-۶$$

$$\lim_{x\to ۴}\frac{x-۴}{\sqrt{x}-۲}=\frac{۰}{۰}\xrightarrow{\text{رفع ابهام}}\frac{(\sqrt{x}+۲)\cancel{(\sqrt{x}-۲)}}{\cancel{\sqrt{x}-۲}}=۴$$

$$\lim_{x\to ۲}\frac{x-\sqrt{۲x}}{۲x^۲-x-۶}=\frac{۰}{۰}\xrightarrow{\text{رفع ابهام}}\frac{\sqrt{x}(\sqrt{x}-\sqrt{۲})}{(x-۲)(۲x+۳)}=\frac{\sqrt{x}\cancel{(\sqrt{x}-\sqrt{۲})}}{\cancel{(\sqrt{x}-\sqrt{۲})}(\sqrt{x}+\sqrt{۲})(۲x+۳)}$$

$$\begin{array}{l|l} ۲x^۲-x-۶ & x-۲ \\ \hline -۲x^۲+۴x & ۲x+۳ \\ \hline ۳x-۶ & \end{array}
\qquad =\frac{\sqrt{۲}}{۷(۲\sqrt{۲})}=\frac{\cancel{\sqrt{۲}}}{۱۴\cancel{\sqrt{۲}}}=\frac{۱}{۱۴}$$

$$\lim_{x\to ۱}\frac{۱-\sqrt{x}}{۲-\sqrt{۵-x}}\times\frac{۱+\sqrt{x}}{۱+\sqrt{x}}\times\frac{۲+\sqrt{۵-x}}{۲+\sqrt{۵-x}}=\frac{۱-x}{۴-۵+x}\times\frac{۴}{۲}=-۲$$

$$\lim_{x\to ۴}\frac{\sqrt{۳x+۴}-۴}{\sqrt[۳]{۵x+۷}-۳}\times\frac{\sqrt{۳x+۴}+۴}{\sqrt{۳x+۴}+۴}\times\frac{\sqrt[۳]{(۵x+۷)^۲}+۹+۳\sqrt[۳]{۵x+۷}}{\sqrt[۳]{(۵x+۷)^۲}+۹+۳\sqrt[۳]{۵x+۷}}$$

$$=\frac{۳x+۴-۱۶}{۵x+۷-۲۷}\times\frac{۲۷}{۸}=\frac{۳x-۱۲}{۵x-۲۰}\times\frac{۲۷}{۸}=\frac{۳\cancel{(x-۴)}}{۵\cancel{(x-۴)}}\times\frac{۲۷}{۸}=\frac{۸۱}{۴۰}$$

$$\lim_{x\to ۱}\frac{\sqrt{۳x+\sqrt{x}}-۲}{\sqrt[۳]{x}-۱}\times\frac{\sqrt{۳x+\sqrt{x}}+۲}{\sqrt{۳x+\sqrt{x}}+۲}\times\frac{\sqrt[۳]{(x)^۲}+۱+\sqrt[۳]{x}}{\sqrt[۳]{(x)^۲}+۱+\sqrt[۳]{x}}$$

$$=\frac{۳x+\sqrt{x}-۴}{x-۱}\times\frac{۳}{۴}=\frac{\cancel{(\sqrt{x}-۱)}(\sqrt{x}+\frac{۴}{۳})}{\cancel{(\sqrt{x}-۱)}(\sqrt{x}+۱)}=\frac{۷}{۸}$$

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

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

$$=-\sqrt{2}$$

$$\lim_{x\to\frac{3\pi}{4}}\frac{\tan^2 x-1}{\underbrace{\cos 2x}_{\cos^2\alpha-\sin^2\alpha}}=\frac{\frac{\sin^2 x}{\cos^2 x}-1}{\cos^2 x-\sin^2 x}=\frac{\frac{\sin^2 x-\cos^2 x}{\cos^2 x}}{\cos^2 x-\sin^2 x}$$

$$-\frac{\cancel{(\cos^2 x-\sin^2 x)}}{\cos^2 x}\times\frac{1}{\cancel{(\cos^2 x-\sin^2 x)}}=-2$$