مهرشید جباری زاده — تألیف شماره ۳۵ — پاسخ‌نامه برگ

$$\lim_{x\to 1}\frac{(6x-1)(5x-3)}{(x-1)(6x-3)}=\frac{1\times 2}{3}=\frac{2}{3}$$

$$\lim_{x\to 0}\frac{|\cos x-1|-|\cos x+1|}{x^2}\xrightarrow{x\to 0^+}\frac{-(\cos x-1)-(\cos x+1)}{0^+}=\frac{-2\cos x}{x^2}=-\infty$$

حد ندارد

$$x\to 0^-:\ \frac{-\cos x+1-\cos x-1}{x^2}=\frac{-2\cos x}{x^2}=-\infty$$

$$\lim_{x\to 4}\frac{\sqrt{x}^3-2^3}{\sqrt{x}-2}=\frac{(\sqrt{x}-2)(x+2\sqrt{x}+4)}{\sqrt{x}-2}=x+2\sqrt{x}+4=4+4+4=12$$

$$\lim_{x\to 2}\frac{\sqrt{x}(\sqrt{x}-\sqrt{2})}{(x-2)(3x+3)}=\frac{\sqrt{2}}{9}$$

صورت را مزدوج بگیرید

$$\lim_{x\to 1}\frac{1-\sqrt{x}}{2-\sqrt{3-x}}=\frac{1-x}{(1-x)(\sqrt{3-x}+\sqrt{2})}=\frac{1}{\sqrt{3-1}+\sqrt{2}}=\frac{1}{2\sqrt{2}}$$

صورت و مخرج را مزدوج بگیرید

$$\lim_{x\to 4}\frac{\sqrt{6x+8}-4}{\sqrt[3]{5x+7}-3}=\frac{\sqrt{6x+8}-4}{\sqrt[3]{5x+7}-3}\times\frac{\sqrt{6x+8}+4}{\sqrt{6x+8}+4}\times\frac{\sqrt[3]{(5x+7)^2}+3\sqrt[3]{5x+7}+9}{\sqrt[3]{(5x+7)^2}+3\sqrt[3]{5x+7}+9}$$

$$=\frac{(6x-16)\times 27}{(5x-20)\times 8}=\frac{27}{8}$$

$$\lim_{x\to 1}\frac{\sqrt{6x+\sqrt{x}}-2}{\sqrt[3]{x}-1}\times\frac{\sqrt{6x+\sqrt{x}}+2}{\sqrt{6x+\sqrt{x}}+2}\times\frac{\sqrt[3]{x^2}+\sqrt[3]{x}+1}{\sqrt[3]{x^2}+\sqrt[3]{x}+1}=-\sqrt{}$$

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

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

$$\frac{2}{\sqrt{2}}=\frac{-2\times\sqrt{2}}{2}=-\sqrt{2}$$

$$\lim_{x\to\frac{5\pi}{4}}\frac{\tan^2 x-1}{\cos^2 x}=\frac{(\tan x-1)(\tan x+1)}{\cos^2 x-\sin^2 x}=\left(\frac{\sin^2 x}{\cos x}-1\right)=\frac{\sin^2 x-\cos^2 x}{\cos^2 x-\sin^2 x}=-1$$

$$\frac{-1}{\cos^2\frac{5\pi}{4}}=\frac{-2}{1}$$

الجواب على سؤال 8:

$$\frac{1-\sqrt{x-1}}{2-\sqrt{5-x}}\times\frac{1+\sqrt{x-1}}{1+\sqrt{x-1}}\times\frac{2+\sqrt{5-x}}{2+\sqrt{5-x}}$$

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

الجواب على سؤال 9: