نام و نام خانوادگی ..ابوالفضل ابوفاضلی.... پاسخنامه تشریحی تکلیف شماره ...۳۵.. کلاس ....

۱

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

۲

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

۳

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

۴

$$\lim_{x\to 2} \frac{x-\sqrt{2x}}{2x^2-x-6} \Rightarrow \frac{x-\sqrt{2x}}{2x^2-x-6} \times \frac{x+\sqrt{2x}}{x+\sqrt{2x}} = \frac{x^2-2x}{(2x^2-x-6)(x+\sqrt{2x})}$$

$$= \frac{x\cancel{(x-2)}}{\cancel{(x-2)}(2x+3)(x+\sqrt{2x})} = \frac{2}{(4+3)(2+2)} = \frac{1}{14}$$

۵

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

$$= \frac{(1)(2+\sqrt{4})}{(-1)(1+1)} = -2$$

$$\lim_{x\to 4}\frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3}\to\frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3}\times\frac{\sqrt{3x+4}+4}{\sqrt{3x+4}+4}\times\frac{\sqrt[3]{25x^2+49+70x}+9+3\sqrt[3]{5x+7}}{\sqrt[3]{25x^2+49+70x}+9+3\sqrt[3]{5x+7}}$$

$$=\frac{\overbrace{\cancel{(3x+4-16)}}^{3\cancel{(x-4)}}\left(\sqrt[3]{25x^2+49+70x}+9+3\sqrt[3]{5x+7}\right)}{\underbrace{\cancel{(5x+7-27)}}_{5\cancel{(x-4)}}\left(\sqrt{3x+4}+4\right)}=\frac{3\times 27}{5\times 8}=\frac{81}{40}$$ ۶

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

$$=\frac{3x+\sqrt{x}-4}{x-1}\times\frac{\sqrt[3]{x^2}+1+\sqrt[3]{x}}{\sqrt{3x+\sqrt{x}}+2}=\frac{\cancel{(\sqrt{x}-1)}(3\sqrt{x}+4)}{\cancel{(\sqrt{x}-1)}(\sqrt{x}+1)}\times\frac{\sqrt[3]{x^2}+1+\sqrt[3]{x}}{\sqrt{3x+\sqrt{x}}+2}$$ ۷

$$=\frac{7}{2}\times\frac{3}{4}=\frac{21}{8}$$

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

$$=\frac{1+1-(-1)}{1-(-1)}=\frac{3}{2}=1{,}5$$ ۸

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

$$=\frac{-1}{\frac{\sqrt{2}}{2}}=-\frac{2}{\sqrt{2}}=-\sqrt{2}$$ ۹

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

$$=\frac{(1+(-1)^2)}{(-1)}=-2$$ ۱۰