نام و نام خانوادگی ......امیرحسین برغشی...... پاسخنامه تشریحی تکلیف شماره ..۳۰.. کلاس .یازدهم......

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

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

$$=\frac{-6x}{x}=\boxed{-6}$$

۳

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

۴

$$\lim_{x\to 2}\frac{x-\sqrt{2x}}{2x^2-x-6}=\frac{2-2}{0}=\frac{0}{0}$$

$$\longrightarrow \lim\frac{x-\sqrt{2x}}{2x^2-x-6}\times\frac{x+\sqrt{2x}}{x+\sqrt{2x}}=\frac{x^2-2x}{\cancel{(x-2)}(2x+3)(x+\sqrt{2x})}=\frac{x}{\underbrace{(2x+3)}_{7}\times\underbrace{(x+\sqrt{2x})}_{4}}=$$

$$x^2-2x \to x\cancel{(x-2)}$$

$$\frac{2}{28}=\boxed{\frac{1}{14}}$$

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

$$=\frac{\overset{-1}{\cancel{(1-x)}}(2+\sqrt{5-x})}{\underbrace{(4-5+x)}_{\cancel{x-1}}(1+\sqrt{x})}=\frac{-(2+\sqrt{5-x})}{1+\sqrt{x}}=-\frac{4}{2}=\boxed{-2}$$

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

$$3x-12 \qquad \frac{0}{0}=$$

$$3(x-4)$$

$$=\frac{(3x+4-16)\left(\sqrt[3]{(5x+7)^2}+9+3\sqrt[3]{5x+7}\right)}{(5x+7-27)\left(\sqrt{3x+4}+4\right)}=\frac{3(3\times 9)}{5(8)}=\boxed{\frac{81}{40}}$$

$$5(x-4)$$

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

$$(\sqrt{x}-1)(\sqrt{x}+1)$$

$$=\left(3(x-1)+\sqrt{x}-1\right)\times\frac{\sqrt[3]{x^2}+\sqrt[3]{x}+1}{\sqrt{3x+\sqrt{x}}+2}=\frac{\cancel{(\sqrt{x}-1)}\left[3\sqrt{x}+3+1\right]}{\cancel{(\sqrt{x}-1)}(\sqrt{x}+1)}\times\frac{\sqrt[3]{x^2}+\sqrt[3]{x}+1}{\sqrt{3x+\sqrt{x}}+2}$$ 7

$$=\frac{3+4}{1+1}\times\frac{1+1+1}{\underbrace{\sqrt{3+1}}_{2}+2}=\frac{7}{2}\times\frac{3}{4}=\boxed{\frac{21}{8}}$$

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

$$\sin^2 x \to 1-\cos^2 x$$

$$=\frac{3}{2}=\boxed{1.5}$$ 8

$$\lim_{x\to\frac{\pi}{4}}\frac{1-\tan x}{\sin x-\cos x}=\frac{0}{0}\longrightarrow\frac{1-\frac{\sin x}{\cos x}}{\sin x-\cos x}=\frac{\frac{\cos x-\sin x}{\cos x}}{\sin x-\cos x}=\frac{\overset{-1}{\cancel{(\cos x-\sin x)}}}{\cancel{(\sin x-\cos x)}(\cos x)}$$ 9

$$=-\frac{1}{\cos\frac{\pi}{4}}=-\frac{2}{\sqrt{2}}\times\frac{\sqrt{2}}{\sqrt{2}}=\boxed{-\sqrt{2}}$$

$$\lim_{x\to\frac{3\pi}{4}}\frac{\tan^2 x-1}{\cos 2x}=\frac{0}{0}\longrightarrow\lim\frac{\frac{1-\cos 2x}{1+\cos 2x}-1}{\cos 2x}=\frac{\cancel{1}-\cos 2x-\cancel{1}-\cos 2x}{(1+\cos 2x)(\cos 2x)}$$

$$=\frac{-2\cancel{\cos 2x}}{(1+\cos 2x)\cancel{(\cos 2x)}}=\frac{-2}{1+\cos\frac{3\pi}{2}}=\frac{-2}{1}=\boxed{-2}$$ 10