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نام و نام خانوادگی ......[illegible]...... پاسخنامه تشریحی تکلیف شماره ..۲.... کلاس ..دوازدهم ریاضی A....

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$$\lim_{x\to 2}\frac{\overset{-1}{2x-5}}{\underbrace{x^2+ax+b}_{0^+}}=-\infty \Rightarrow x^2+ax+b=(x-2)^2$$

$$x^2-4x+4=x^2+ax+b \leadsto a=-4\ ,\ b=4$$

$$\boxed{a+b=0}$$

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$$\lim_{x\to\sqrt[3]{4}}\frac{\overset{\sqrt[3]{4}}{x}}{\underbrace{x^2+ax+b}_{0^+}}=+\infty \Rightarrow x^2+ax+b=\left(x-\sqrt[3]{4}\right)^2$$

$$x^2-\sqrt[3]{32}\,x+\sqrt[3]{16}=x^2+ax+b \leadsto a=-\sqrt[3]{32}\quad b=\sqrt[3]{16}$$

$$\left[\frac{b}{a}\right]=\left[\frac{\sqrt[3]{16}}{-\sqrt[3]{32}}\right]=\left[-\sqrt[3]{\frac{1}{2}}\right]=-1$$

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$$\lim_{x\to\left(\frac{1}{\sqrt{3}}\right)^+}\frac{[-x]+a}{\left|\frac{\sqrt{3}}{3}x+a\right|+a}=-\infty \leadsto \lim_{x\to\left(\frac{1}{\sqrt{3}}\right)^+}\frac{a-1}{\left|\frac{1}{3}+a\right|+a}=-\infty$$

$$\left|\frac{1}{3}+a\right|=-a \leadsto a<0 \to \frac{1}{3}+a=-a \quad a=-\frac{1}{6}$$

$$[a]=\left[-\frac{1}{6}\right]=-1$$

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$$\lim_{x\to\left(-\frac{1}{2}\right)^+}\frac{16x-\left[-\frac{2}{x^2}\right]}{24x+\left[\frac{3}{x^2}\right]} \leadsto$$

$$x>-\frac{1}{2}\to x^2>\frac{1}{4}\to\frac{1}{x^2}<4\to\frac{-2}{x^2}>-8\to\left[\frac{-2}{x^2}\right]=-8$$

$$x>-\frac{1}{2}\to x^2>\frac{1}{4}\to\frac{1}{x^2}<4\to\frac{3}{x^2}<12\to\left[\frac{3}{x^2}\right]=11$$

$$x>-\frac{1}{2}\to x^2<\frac{1}{4}\to\frac{1}{x^2}>4\to\frac{3}{x^2}>12\to\left[\frac{3}{x^2}\right]=12$$

$$\frac{1}{x^2}>4\to\frac{-2}{x^2}<-8\to\left[\frac{-2}{x^2}\right]=-9$$

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$$=\lim_{x\to\left(-\frac{1}{2}\right)^+}\frac{16x+8}{24x+11}=0$$

$$\lim_{x\to\left(-\frac{1}{2}\right)^+}=\frac{16x+9}{24x+12}=\lim_{x\to\left(-\frac{1}{2}\right)^+}\frac{-8+9}{0^+}=\frac{1}{0^+}=+\infty$$

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$$\lim_{x\to 2^+}\frac{x^2-4}{x^3-[x^3]}=\lim_{x\to 2^+}\frac{x^2-4}{x^3-8}=\lim_{x\to 2^+}\frac{\cancel{(x-2)}(x+2)}{\cancel{(x-2)}(x^2+2x+4)}=\frac{4}{12}=\frac{1}{3}$$

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$$\lim_{x\to -8} \frac{x^2+10x+16}{12+4\sqrt[3]{x}} \xrightarrow{hop} \lim_{x\to -8} \frac{2x+10}{\frac{4}{3\sqrt[3]{x^2}}} = \lim_{x\to -8} (x+5)(3\sqrt[3]{x^2})$$

$$= -3\times 4 = -12$$

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$$\lim_{x\to 0^-} \frac{\sqrt{2+3x}-\sqrt{2-x}}{\sqrt{1-\cos x}} \times \frac{\text{مزدوج}}{\text{مزدوج}} \times \frac{\text{مزدوج}}{\text{مزدوج}} = \lim_{x\to 0^-} \frac{(\cancel{2}+3x-\cancel{2}+x)\times\cancel{\sqrt{2}}}{\underbrace{|\sin x|}_{-\sin x}\times 2\cancel{\sqrt{2}}}$$

$$\lim_{x\to 0^-} \frac{4x}{-2\sin x} = \frac{4\cancel{x}}{-2\cancel{x}} = -2$$

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حد مخرج صفر و حاصل حد عددی حقیقی وغیر صفر ← حد صورت نیز برابر صفر بوده

$$\lim_{x\to 0} k+\cos(\sqrt{a}x)=0 \to k+1=0 \to k=-1$$

$$\lim_{x\to 0} \frac{-1+\cos(\sqrt{a}x)}{-x^2} \xrightarrow{\text{هم‌ارزی}} \lim_{x\to 0} \frac{-1+1-\frac{(\sqrt{a}x)^2}{2}}{-x^2} = \lim_{x\to 0} \frac{\frac{-ax^2}{2}}{-x^2} = \frac{a}{2} \to \frac{a}{2}=3 \to a=6$$

$$\frac{a}{k} = \frac{6}{-1} = -6$$

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$$\lim_{x\to 3a^+} \frac{2\sqrt{x-3a}}{\sqrt{x-3a}\sqrt{x+3a}} + \frac{3\sqrt{x}-3\sqrt{3a}}{\sqrt{x-3a}\sqrt{x+3a}} = \lim_{x\to 3a^+} \left(\frac{2}{\sqrt{6a}} + \frac{3(\sqrt{x}-\sqrt{3a})}{\sqrt{x-3a}\sqrt{x+3a}} \times \frac{\sqrt{x}+\sqrt{3a}}{\sqrt{x}+\sqrt{3a}}\right) \to$$

$$\lim_{x\to 3a^+} \left(\frac{2}{\sqrt{6a}} + \frac{2(x-3a)}{(\sqrt{x-3a}\sqrt{x+3a})(\sqrt{x}+\sqrt{3a})}\right) = \lim_{x\to 3a^+} \left(\frac{2}{\sqrt{6a}} + \frac{3\sqrt{x-3a}\to 0}{(\sqrt{x}+\sqrt{3a})(\sqrt{x}+\sqrt{3a})}\right) = \lim_{x\to 3a^+} \frac{2}{\sqrt{6a}} + 0$$

$$\to \frac{\sqrt{4}}{\sqrt{6a}} = \sqrt{\frac{4}{6a}} = \sqrt{\frac{2}{3a}}$$

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$$\lim_{x\to -1} \frac{1-k[x]}{x^2-1} = -\infty$$

$\to -1^+ : \frac{1+k}{0^-} = -\infty \quad 1+k>0 \to k>-1$

$\to -1^- : \frac{1+2k}{0^+} = -\infty \quad 1+2k<0 \to k<-\frac{1}{2}$

$$\Big\} -1<k<-\frac{1}{2}$$

$-\pi<k\pi<-\frac{\pi}{2} \to -1<\cos k\pi<0 \to$ ناحیه ۳

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