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نام و نام خانوادگی .... فرید ..... پاسخنامه تشریحی تکلیف شماره .... کلاس ....

$\lim_{x\to 2}\frac{2x-5}{x^2+ax+b}=-\infty \Rightarrow \lim_{x\to 2}\frac{2(2)-5}{x^2+ax+b}=\frac{-1}{x^2+ax+b}=-\infty$ $\hookrightarrow x^2-4x+4=(x-2)^2$ $a=-4$ $b=4$ $a+b=-4+4=$ صفر ✓ 2	۱
$\lim_{x\to\sqrt[3]{4}}\frac{x}{x^2+ax+b}=+\infty \Rightarrow \lim_{x\to\sqrt[3]{4}}\frac{\sqrt[3]{4}}{\underbrace{x^2+ax+b}_{\to 0^+}}=+\infty \Rightarrow (x-\sqrt[3]{4})^2=x^2-2\sqrt[3]{4}x+2\sqrt[3]{2}$ $b=2\sqrt[3]{2}$ $a=-2\sqrt[3]{4}$ $\left[\frac{b}{a}\right]=\left[\frac{2\sqrt[3]{2}}{-2\sqrt[3]{4}}\right]=\left[\frac{\sqrt[3]{2}}{-\sqrt[3]{2}\times\sqrt[3]{2}}\right]=\left[\frac{-1}{\sqrt[3]{2}}\right]=\boxed{-1}$ ✓ 2	۲
$\lim_{x\to(\frac{1}{\sqrt{3}})^+}\frac{[x]+4}{\left\|\frac{\sqrt{3}}{3}x+a\right\|+a}=-\infty$ حاصل حد به $-\infty$ میل کرده ← مخرج به صفر میل می‌کند. $\lim_{x\to(\frac{1}{\sqrt{3}})^+}=\left\|\frac{\sqrt{3}}{3}x+a\right\|=\left\|\frac{1}{\sqrt{3}}\times\frac{\sqrt{3}}{3}+a\right\|+a=0 \to \left\|\frac{1}{3}+a\right\|+a=0$ $\to \begin{cases} a\geq -\frac{1}{3} \to 2a+\frac{1}{3}=0 \to a=\frac{-1}{6} ✓ \\ a<-\frac{1}{3} \to -a-\frac{1}{3}+a=0 ✗ \end{cases} \to [a]=[-\frac{1}{6}]=-1$ 0	۳
$\lim_{x\to(-\frac{1}{2})^+}\frac{14x-[-\frac{2}{x^2}]}{24x+[\frac{3}{x^2}]} \Rightarrow \lim_{x\to(-\frac{1}{2}^+)}\frac{14x-[-\frac{2}{\frac{1}{4}^-}]}{24x+[\frac{3}{\frac{1}{4}^-}]}=\lim_{x\to(-\frac{1}{2}^+)}\frac{14x-[-(8^+)]}{24x+[12^+]}=\frac{14x+9}{24x+12} \overset{HOP}{=} \frac{14}{24}$ $x>-\frac{1}{2} \Rightarrow x^2<\frac{1}{4}$ $x>-\frac{1}{2} \to x^2<\frac{1}{4} \to \frac{1}{x^2}>4 \to \frac{3}{x^2}>12 \to [\frac{3}{x^2}]=12$ $\frac{1}{x^2}>4 \to \frac{-2}{x^2}<-8 \to [\frac{-2}{x^2}]=-9$ $\lim_{x\to(-\frac{1}{2})^+}=\frac{14x+9}{24x+12}=\lim_{x\to(-\frac{1}{2})^+}\frac{-8+9}{0^+}=\frac{1}{0^+}=+\infty$ 1	۴
$\lim_{x\to 2^+}\frac{x^2-4}{x^3-[x^3]} \Rightarrow \lim_{x\to 2^+}\frac{x^2-4}{x^3-8} \overset{HOP}{=} \lim_{x\to 2^+}\frac{2x}{3x^2}=\frac{4}{12}=\boxed{\frac{1}{3}}$ ✓ 2	۵

فرید غاوی

۶

$$\lim_{x\to -8}\frac{x^2+10x+16}{12+6\sqrt[3]{x}} \overset{Hop}{\Longrightarrow} \lim_{x\to -8}\frac{2x+10}{6\left(\frac{1}{3\sqrt[3]{x^2}}\right)} \Rightarrow \lim_{x\to -8}\frac{2x+10}{\frac{2}{\cancel{6}\sqrt[3]{x^2}}} = \frac{2(-8)+10}{\frac{1}{\frac{2}{\cancel{6}\times 4}}} =$$

1.5

$$\frac{-6}{\frac{1}{2}} = -12$$

$$\cancel{\frac{\frac{-6}{\frac{1}{2}}}{\frac{1}{12}} = \frac{12\times -6}{2} = \boxed{-36}}$$

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$$\lim_{x\to 0^-}\frac{\sqrt{2+3x}-\sqrt{2-x}}{\sqrt{1-\cos x}} = \lim_{x\to 0^-}\frac{2+3x-(2-x)}{2\sqrt{2}\left(\sqrt{1-\cos x}\right)} = \frac{\frac{4}{1}}{\frac{0^-}{2(0^+)}} =$$ تعریف نشده

0

$$\lim_{x\to 0^-}\frac{\sqrt{2+3x}-\sqrt{2-x}}{\sqrt{1-\cos x}}\times\frac{\sqrt{2+3x}+\sqrt{2-x}}{\sqrt{2+3x}+\sqrt{2-x}}\times\frac{\sqrt{1+\cos x}}{\sqrt{1+\cos x}} \rightarrow$$

$$\lim_{x\to 0^-}\frac{2+3x-2+x}{\sqrt{1-\cos^2 x}}\times\frac{\sqrt{1+\cos x}}{2\sqrt{2}} = \lim_{x\to 0^-}\frac{4x\times\sqrt{2}}{|\sin x|\times 2\sqrt{2}} = \lim_{x\to 0^-}\frac{4x\times\sqrt{2}}{-2\sqrt{2}\sin x} \xrightarrow{\text{فشردگی}} \lim_{x\to 0^-}\underbrace{\frac{x}{\sin x}}_{1}\times\frac{4\sqrt{2}}{-2\sqrt{2}} = -2$$

۸

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

1

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

$$k+\cos(\sqrt{a}\times 0) = 0 \Rightarrow k+\underbrace{\cos(0)}_{1} = 0 \Rightarrow k=-1$$

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

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

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

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

0

۱۰

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

$$-1^+:\ \frac{1-k(-1)}{x^2-1} = -\infty \Rightarrow \lim_{x\to -1^+}\frac{1+k}{x^2-1} = -\infty \Rightarrow \frac{1+k}{0^-} = -\infty$$

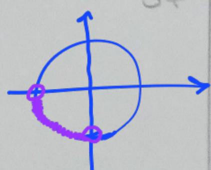
$$-1^-:\ \frac{1-k(-2)}{x^2-1} = -\infty \Rightarrow \lim_{x\to -1^-}\frac{1+2k}{x^2-1} = -\infty \Rightarrow \frac{1+2k}{0^+} = -\infty$$

1.5

$$1+k>0 \Rightarrow k>-1$$

$$1+2k<0 \Rightarrow 2k<-1 \Rightarrow k<-\frac{1}{2}$$

$$-1<k<-\frac{1}{2} \rightarrow \begin{cases}-\pi<k\pi<-\frac{\pi}{2}\\ -1<\cos k\pi<0\end{cases}$$



ناحیه سوم