۱۰٪ امتیاز - گروه پسر B   بنام خدا   تکلیف شماره ۲

۲۰ آذر

۱- $\lim_{x\to 2} \frac{2x-5}{x^2+ax+b} = -\infty \to \frac{-1}{4+2a+b} = -\infty \to 2a+b+4=0 \to 2a+b=-4$

$x^2+ax+b=(x+\frac{a}{2})^2=(x-2)^2=x^2-4x+4 \to a=-4,\ b=4 \to a+b=(-4)+4=0$

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۲- $\lim_{x\to\sqrt[3]{4}} \frac{x}{x^2+ax+b} = +\infty \to \frac{\sqrt[3]{4}}{\sqrt[3]{16}+\sqrt[3]{4}a+b} = -\infty \to \sqrt[3]{4}a+b+\sqrt[3]{16}=0 \to \sqrt[3]{4}a+b=-\sqrt[3]{16}$

$x^2+ax+b=(x+\frac{a}{2})^2=(x-\sqrt[3]{4})^2=x^2-2\sqrt[3]{4}x+\sqrt[3]{16} \to a=-2\sqrt[3]{4},\ b=\sqrt[3]{16} \quad [\frac{b}{a}]=-1$

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۳- $\lim_{x\to\frac{1}{3}^+} \frac{[-x]+a}{|[\frac{3}{2}]x+a|+a} = -\infty \to \frac{a-1}{|\frac{1}{3}+a|+a} = -\infty \to |a+\frac{1}{3}|+a=0 \to a\geq -\frac{1}{3} \to 2a+\frac{1}{3}=0 \to \frac{-\frac{7}{6}}{0^-}=-\infty$

$a<-\frac{1}{3} \to -a-\frac{1}{3}-a=0 \to -\frac{1}{3}=0$ ✗

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

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۴- $\lim_{x\to(-\frac{1}{2})^+} \frac{16x-[-\frac{2}{x^2}]}{24x+[\frac{3}{x^2}]} \to \lim_{x\to(-\frac{1}{2})^+} \frac{16x+9}{24x+12} \to \frac{1}{0^+}=+\infty$

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۵- $\lim_{x\to2^+} \frac{x^2-4}{x^3-[x^3]} = \frac{x^2-4}{x^3-8} = \frac{(x-2)(x+2)}{(x-2)(x^2+2x+4)} = \frac{x+2}{x^2+2x+4} = \frac{4}{12}=\frac{1}{3}$

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۶- $\lim_{x\to-8} \frac{x^2+10x+16}{12+6\sqrt[3]{x}} = \frac{(x+8)(x+2)}{6(2+\sqrt[3]{x})} = \frac{(\sqrt[3]{x}+2)(\sqrt[3]{x^2}-2\sqrt[3]{x}+4)(x+2)}{6(2+\sqrt[3]{x})} = \frac{(\sqrt[3]{x^2}+2\sqrt[3]{x}+4)}{6} = \frac{12\cdot(-6)}{6}=-12$

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۷- $\lim_{x\to0^-} \frac{\sqrt{2+3x}-\sqrt{2-x}}{\sqrt{1-\cos x}} \to \times\frac{\sqrt{2+3x}+\sqrt{2+x}}{\sqrt{2+3x}+\sqrt{2+x}} = \frac{2+3x-2+x}{\sqrt{\frac{x^2}{2}}\times2\sqrt{2}} = \frac{4x}{|x|\cdot2}=-2$

$1-\cos x=\frac{x^2}{2}$

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۸- $\lim_{x\to0} \frac{k+\cos(\sqrt{a}x)}{kx^2}=3 \to k+\cos0 = \frac{3}{0} \to k+1=0 \to k=-1 \to \lim_{x\to0} \frac{\cos(\sqrt{a}x)-1}{-x^2}$

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$hop: \lim_{x\to0} \frac{-\sqrt{a}\sin(\sqrt{a}x)}{-2x} = \frac{0}{0} \xrightarrow{hop} \frac{-a\cos(\sqrt{a}x)}{-2} = \frac{-a}{-2}=\frac{a}{2}=3 \to a=6$

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

۰/۵ نمره ستاری

$$\lim_{x\to(3a)^+}\frac{2\sqrt{x-3a}+3\sqrt{x}-\sqrt{27x}}{\sqrt{x^2-9a^2}}=\frac{0}{0}\to\lim\frac{2}{\sqrt{x+3a}}+\frac{3\sqrt{x}-3\sqrt{3a}}{\sqrt{x^2-9a^2}}=\frac{2}{\sqrt{6a}}+\frac{3(x-3a)}{\sqrt{x+3a}\cdot\sqrt{x-3a}\cdot 2\sqrt{3a}}$$

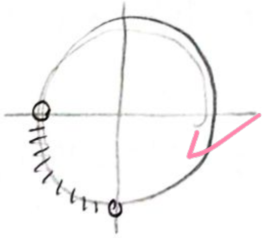
$$\left(\frac{2}{\sqrt{6a}}+0\right)$$

$$\frac{2}{\sqrt{6a}}$$

-۱۰.

$$\lim_{x\to-1}\frac{1-k[x]}{x^2-1}\;\begin{cases}\xrightarrow{+}\dfrac{1+k}{x^2-1}=\dfrac{1+k}{0^-}=-\infty\to 1+k>0\to k>-1\\[2ex]\xrightarrow{-}\dfrac{1+2x}{x^2-1}=\dfrac{1+2k}{0^+}=+\infty\to 1+2k<0\to k<-\dfrac{1}{2}\end{cases}$$

$$-1<k<-\frac{1}{2}\;\begin{cases}\to -\pi<k\pi<-\dfrac{\pi}{2}\\[1ex]\to -1<\cos k\pi<0\end{cases}$$



ناحیه ۳