آدرینا حسینی   تکلیف شماره ۲۰   درس ریاضی دوازدهم دفتر A عجد

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$$\lim_{x\to 2}\frac{\overset{x=2\,\to\,-1}{2x-5}}{x^2+ax+b}=-\infty \to \frac{-1}{0^+}=-\infty \longrightarrow$$

*پس $x=2$ ریشه مضاعف مخرج هست.

$$\longrightarrow (x-2)^2=x^2-4x+4 \;\to\; a=-4\,,\; b=4 \to a+b=4-4=\boxed{0}$$

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

یعنی $x=\sqrt[3]{4}$ ریشه مضاعف مخرج هست.

$$\longrightarrow (x-\sqrt[3]{4})^2=x^2\underbrace{-2\sqrt[3]{4}}_{a}\,x+\underbrace{\sqrt[3]{16}}_{b}$$

$$\left[\frac{b}{a}\right]=\left[\frac{\sqrt[3]{16}}{-2\sqrt[3]{4}}\right]=\left[\frac{1}{-\sqrt[3]{2}}\right]=\left[\frac{-1}{1/\dots}\right]=\boxed{-1}$$

$$\sqrt[3]{1}<\sqrt[3]{2}<\sqrt[3]{8} \longrightarrow 1<\sqrt[3]{2}<2$$

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

$$\to \frac{1}{3}+a>0\ \checkmark \qquad \frac{1}{3}+a<0\ \times$$

$$\longrightarrow \frac{a-1}{\frac{1}{3}+2a}=-\infty \;\to\; 2a=-\frac{1}{3} \to \boxed{a=-\frac{1}{6}} \;\to\; [a]=\left[-\frac{1}{6}\right]=\boxed{-1}$$

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$$\lim_{x\to(-\frac{1}{2})^+}\frac{16x-\left[\frac{-2}{x^2}\right]}{24x+\left[\frac{3}{x^2}\right]}=\frac{16x+17}{24x+12}=\frac{-8+17}{0^+}=\frac{9}{0^+}=\boxed{+\infty}$$

$$x>-\frac{1}{2} \to x^2<\frac{1}{4} \to \frac{-2}{x^2}<-16 \to \left[\frac{-2}{x^2}\right]=-17$$

$$\frac{1}{x^2}>4 \to \frac{2}{x^2}>8 \quad \Big\} \quad x>-\frac{1}{2} \to x^2<\frac{1}{4} \to \frac{1}{x^2}>4 \to \frac{3}{x^2}>12 \to \left[\frac{3}{x^2}\right]=12$$

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

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

$$-8^-: \frac{+}{0^-}=\boxed{-\infty} \qquad -8^+: \frac{-}{0^+}=\boxed{-\infty}$$

	-8		-2	
$+$		$-$		$+$

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$$\lim_{x\to 0^-}\frac{\sqrt{2+3x}-\sqrt{2-x}}{\sqrt{1-\cos x}}=\frac{0}{0}\times\frac{\overset{\to\sqrt{2}}{\sqrt{1+\cos x}}}{\sqrt{1+\cos x}}\times\frac{\sqrt{2+3x}+\sqrt{2-x}}{\underbrace{\sqrt{2+3x}+\sqrt{2-x}}_{2\sqrt{2}}}=\frac{\cancel{2}+3x-\cancel{2}+x}{1-\cos^2 x}\times\frac{\sqrt{2}}{2\sqrt{2}}=\frac{4x}{2}=2x\left(\frac{1}{1-\cos^2 x}\right)$$

$$=\frac{2x}{1}=\boxed{0}$$

$$\lim_{x\to ۰} \frac{K+\cos(\sqrt{a}\,x)}{Kx^{۲}} = ۳ \to \frac{۰}{۰} \xrightarrow[\text{هم‌ارزی}]{} \frac{K+\sqrt{a}x}{Kx^{۲}} \xrightarrow{\text{HOP}} \frac{\sqrt{a}}{۲Kx}$$ ۸

$$\lim_{x\to(۳a)^+} \frac{۲\sqrt{x-۳a}+۳\sqrt{x}-۲۷\sqrt{a}}{\sqrt{x^{۲}-۹a^{۲}}} = \frac{۰}{۰} \to \times$$ ۹

$$\lim_{x\to(-۱)} \frac{۱-K[x]}{x^{۲}-۱} = -\infty \begin{cases} -۱^{+} \to \dfrac{۱+K}{۰^{-}} = -\infty \to ۱+K>۰ \to K>-۱ \\ -۱^{-} \to \dfrac{۱+۲K}{۰^{+}} = -\infty \to ۱+۲K<۰ \to K<-\dfrac{۱}{۲} \end{cases} \to \boxed{-۱<K<-\frac{۱}{۲}}$$ ۱۰