۲۱ ذی القعده ۱۴۳۹

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۱ ، $x=2$ ریشه مضاعف مخرج است.

$$x^2+ax+b=(x-2)^2=x^2-4x+4$$

$$\Rightarrow a=-4 \quad , \quad b=4 \qquad \underline{a+b=-4+4=0}$$

④ ،

$$x > \frac{-1}{2} \Rightarrow x^2 < \frac{1}{4} \Rightarrow \frac{1}{x^2} > 4 \Rightarrow \begin{cases} \frac{-2}{x^2} < -8 \Rightarrow \left[\frac{-2}{x^2}\right] = -9 \\ \frac{3}{x^2} > 12 \Rightarrow \left[\frac{3}{x^2}\right] = 12 \end{cases}$$

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

⑤ ،

$$x \to 2^+ \Rightarrow [x^3] = 8$$

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

⑥ ،

$$\lim_{x \to -8} \frac{x^2+10x+16}{12+6\sqrt[3]{x}} \xRightarrow{HOP} \frac{2x+10}{6\left(\frac{1}{3\sqrt[3]{x^2}}\right)} = \frac{-6}{6\left(\frac{1}{12}\right)} = -12 \checkmark$$

⑦ ،

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

$$= \lim_{x \to 0^-} \frac{(2+3x-2+x)(\sqrt{2})}{(\sqrt{1-\cos^2 x})(2\sqrt{2})} = \frac{4x}{2|\sin x|} = \frac{2x}{-\sin x} = -2 \checkmark$$

10 ؛ $\lim\limits_{x \to (-1)^-} \dfrac{1-k[x]}{x^2-1} = \dfrac{1+2k}{0^+} = -\infty \Rightarrow 1+2k < 0$

$\lim\limits_{x \to (-1)^+} \dfrac{1-k[x]}{x^2-1} = \dfrac{1+k}{0^-} = -\infty \Rightarrow 1+k > 0$

$k < \dfrac{-1}{2} \,,\; k > -1 \Rightarrow -1 < k < \dfrac{-1}{2}$

$\begin{cases} -\pi < k\pi < \dfrac{-\pi}{2} \\ -1 < \cos k\pi < 0 \end{cases} \Rightarrow$ طول و عرض منفی $\Leftarrow$ <u>ناحیه سوم</u>