۱۹٫۵

نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۲ کلاس .....

۱

$\Rightarrow x=2$ ریشه مضاعف $\rightarrow$ علامت ثابت $\rightarrow$ ریشه حدی

$\Rightarrow x^2+ax+b=(x-2)^2=x^2-4x+4 \Rightarrow a+b=0$ ✓

۲

۲

$x=\sqrt[3]{4}$ ریشه حدی $\rightarrow$ علامت ثابت $\rightarrow$ ریشه مضاعف

$\Rightarrow x^2+ax+b \Rightarrow (x-\sqrt[3]{4})^2=x^2-\sqrt[3]{32}\,x+\sqrt[3]{16}$ $\begin{cases} a=-\sqrt[3]{32} \\ b=\sqrt[3]{16} \end{cases}$

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

۳

۱

$\lim\limits_{x\to\frac{1}{2}^+}\frac{14x-\left[-\frac{3}{2x}\right]}{24x+\left[\frac{3}{2x}\right]}=\lim\limits_{x\to\frac{1}{2}}\frac{14x-[-1^+]}{24x+[-12^-]}=$ [illegible]

۴

$=\lim\limits_{x\to\frac{1}{2}^+}\frac{14x+9}{24x-13}=\frac{-1+9}{-12-13}=\frac{-1}{25}=-0.04$

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

$\lim\limits_{x\to(-\frac{1}{2})^+}=\frac{14x+9}{24x+12}=\lim\limits_{x\to(-\frac{1}{2})^+}\frac{-1+9}{0^+}=\frac{1}{0^+}=+\infty$

۴

$\lim\limits_{x\to\frac{1}{\sqrt{2}}^+}\frac{[-x]+a}{|\sqrt{2}x+a|+a}=\lim\limits_{x\to\frac{1}{\sqrt{2}}^+}\frac{a-1}{|a+\frac{1}{2}|+a}=-\infty \rightarrow |a+\frac{1}{2}|<-a \begin{cases} \Rightarrow a+\frac{1}{2}<-a & \checkmark \\ \Rightarrow a+\frac{1}{2}>a & \times \end{cases}$

$\rightarrow 2a<-\frac{1}{2} \Rightarrow a<-\frac{1}{4}$

۳

سپس $\rightarrow \lim\limits_{x\to\frac{1}{\sqrt{2}}^+}\frac{-\frac{1}{2}-1}{0^+}$ ✓ $\Rightarrow [a]=-1$ ✓

۲

۵

$\lim\limits_{x\to2^+}\frac{x^2-4}{x^2-[4^+]}\overset{\lim x^2-4}{\underset{x\to2^+}{=}}\lim\limits_{x\to2^+}\frac{(x-2)(x+2)}{(x-2)(x^2+2x+4)}=\frac{4}{12}=\frac{1}{3}$ ✓

۲

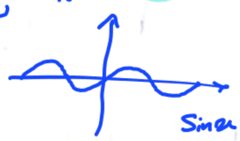
$$\lim_{x\to -8}\frac{x^2+10x+16}{12+6x^{\frac{1}{3}}} \xrightarrow[\text{hop}]{\frac{0}{0}} \lim_{x\to -8}\frac{2x+10}{6\times\frac{1}{3}x^{-\frac{2}{3}}} = \frac{-16+10}{2\times\sqrt[3]{\frac{1}{64}}} = \frac{-6}{\frac{1}{2}} = -12$$

$$\frac{-6}{2\times\sqrt[3]{\left(\frac{-1}{8}\right)^2}} = \frac{-6}{\frac{1}{2}} = -12$$ 6

1,5

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

$$\lim_{x\to 0^-}\frac{4x\times\sqrt{2}}{|\sin x|\times 2\sqrt{2}} = \lim_{x\to 0^-}\frac{4x\times\sqrt{2}}{-2\sqrt{2}\sin x} \xrightarrow{\text{فشردگی}} \lim_{x\to 0^-}\underbrace{\frac{x}{\sin x}}_{1}\times\frac{4\sqrt{2}}{-2\sqrt{2}} = -2$$ 7



0

جواب صفر ← صورت صفر ← عدد $\Rightarrow k+1=0 \Rightarrow k=-1 \Rightarrow \lim_{x\to 0}\frac{\cos(ax)-1}{-x^2}$

$$\xrightarrow[\text{هم‌ارزی}]{\frac{0}{0}} \lim_{x\to 0}\frac{-\frac{ax^2}{2}}{-x^2} = \frac{a}{2} = 3 \Rightarrow a=6 \Rightarrow \boxed{\frac{a}{k}=-6}$$ 8

2

$$\xrightarrow[\text{hop}]{\frac{0}{0}} \lim_{x\to 3a^+}\frac{\frac{1}{\sqrt{x-3a}}+\frac{1}{2\sqrt{x}}}{\frac{x}{\sqrt{x^2-9a^2}}} = \lim_{x\to 3a^+}\frac{\frac{2\sqrt{x}+2\sqrt{x-3a}}{2\sqrt{x}\sqrt{x-3a}}}{\frac{x}{\sqrt{x+3a}\sqrt{x-3a}}} = \frac{\frac{2\sqrt{3a}}{2\sqrt{3a}}}{\frac{3a}{\sqrt{6a}}} = \frac{\sqrt{6a}}{3a} = \sqrt{\frac{6a}{9a^2}} = \sqrt{\frac{2}{3a}}$$ 9

2

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

$$\lim_{x\to -1^-}\frac{1+2k}{x^2-1} = \lim_{x\to -1^-}\frac{1+2k}{0^+} = -\infty \Rightarrow 1+2k<0 \Rightarrow k<-\frac{1}{2}$$ 10

$$\Rightarrow (\underbrace{k\pi}_{x}, \underbrace{\cos k\pi}_{y}) \begin{cases} x<0 \\ y<0 \end{cases} \Rightarrow$$ ناحیه سوم

2