۱۷ حنیف توکلی دوازدهم دسته A

①

$$\lim_{x\to 2}\frac{2x-5}{x^2+ax+b}=-\infty \rightarrow x^2+ax+b=(x-2)^2=x^2-4x+4$$

$$\begin{cases}a=-4\\ b=4\end{cases}$$

$$a+b=-4+4=0$$

۲

②

$$\lim_{x\to\sqrt[3]{4}}\frac{x}{x^2+ax+b}=+\infty \rightarrow x^2+ax+b=(x-\sqrt[3]{4})^2 \rightarrow x^2-2\sqrt[3]{4}\,x+2$$

$$a=-2\sqrt[3]{4}$$

$$b=2$$

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

۲

③

$$\lim_{x\to(\frac{\sqrt{3}}{3})^+}\frac{[-x]+a}{\left|\frac{\sqrt{3}}{3}x+a\right|+a}=-\infty \qquad \left|\frac{\sqrt{3}}{3}\times\frac{1}{\sqrt{3}}+a\right|+a=0$$

$$2a=-\frac{1}{3} \rightarrow a=-\frac{1}{6} \qquad \left[-\frac{1}{6}\right]=-1$$

۲

④ ۰

$$\lim_{x\to(-\frac{1}{2})^+}\frac{19x-[-\frac{2}{x^2}]}{24x+[\frac{3}{x^2}]}=\lim_{x\to(-\frac{1}{2})^+}\frac{19x-4}{24x-12}=\frac{19}{24}=\frac{2}{3}$$

$$\left[-\frac{2}{x^2}\right]=(+4^+]=4 \qquad \left[\frac{3}{x^2}\right]=[-12^+]=-12$$

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

$$\frac{1}{x^2}>4\rightarrow\frac{-2}{x^2}<-8\rightarrow\left[\frac{-2}{x^2}\right]=-9$$

$$\lim_{x\to(-\frac{1}{2})^+}=\frac{19x+9}{24x+12}=\lim_{x\to(-\frac{1}{2})^+}\frac{-8+9}{0^+}=\frac{1}{0^+}=+\infty$$

⑤

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

۲

⑥

$$\lim_{x\to-8}\frac{x^2+10x+16}{12+6\sqrt[3]{x}}=\frac{0}{0}\xrightarrow{Hop}\frac{2x+10}{6\left(\frac{1}{3\sqrt[3]{x^2}}\right)}=\frac{-6}{6(\frac{1}{12})}=-12$$

۲

⑦

$$\lim_{x\to0^-}\frac{\sqrt{2+3x}-\sqrt{2-x}}{\sqrt{1-\cos x}}=\frac{\sqrt{2+3x}-\sqrt{2-x}}{\sqrt{\frac{x^2}{2}}}=\lim_{x\to0^-}\frac{\sqrt{2+3x}-\sqrt{2-x}}{\frac{1}{\sqrt{2}}\underbrace{|x|}_{-x}}=\frac{0}{0}\xrightarrow{Hop}$$

$$\frac{\frac{3}{2\sqrt{2+3x}}+\frac{1}{2\sqrt{2-x}}}{\frac{-1}{\sqrt{2}}}=\frac{\frac{3}{2\sqrt{2}}+\frac{1}{2\sqrt{2}}}{\frac{-1}{\sqrt{2}}}=\frac{\frac{4}{2\sqrt{2}}}{\frac{-1}{\sqrt{2}}}=-2$$

۲

Scanned with CamScanner

ریاضی توکلی دوازدهم دختر A

(11)

$$\lim_{x\to 0}\frac{k+\cos(\sqrt{a}\,x)}{kx^2}=3 \qquad \frac{a}{k}=?$$

$$\xrightarrow{Hop}\frac{-\sqrt{a}\sin(\sqrt{a}\,x)}{2kx}\xrightarrow{Hop}\frac{-a\cos(\sqrt{a}\,x)}{2k}=3$$

$$\lim_{x\to 0}\frac{-a\cos(\cancel{\sqrt{a}}\,x)}{2k}=\frac{-a}{2k}=3\longrightarrow\frac{a}{k}=-6$$

2

---

(9)

1

$$\lim_{x\to 4a^+}\frac{2\sqrt{x-4a}+3(\sqrt{x}-\sqrt{4a})}{\sqrt{x-4a}\times\sqrt{x+4a}}\times\frac{\sqrt{x}+\sqrt{4a}}{\sqrt{x}+\sqrt{4a}}$$

$$\to\lim_{x\to 4a^+}\frac{2\sqrt{x-4a}+3(x-4a)}{\sqrt{x-4a}\cdot\sqrt{x+4a}\,(\sqrt{x}+\sqrt{4a})}$$

$$\lim_{x\to 4a^+}\left(\frac{2}{\sqrt{8a}}+\frac{3(x-4a)}{(\sqrt{x-4a}\sqrt{x+4a})(\sqrt{x}+\sqrt{4a})}\right)$$

$$\to\lim\frac{\cancel{\sqrt{x-4a}}\,(2+3\cancel{(\sqrt{x-4a})})}{\cancel{\sqrt{x-4a}}\cdot\sqrt{x+4a}\,(\sqrt{x}+\sqrt{4a})}=\frac{2}{4\sqrt{2}a^2}\to\frac{\sqrt{4}}{\sqrt{8a}}=\sqrt{\frac{4}{8a}}=\sqrt{\frac{2}{4a}}$$

$$=\lim_{x\to 4a^+}\left(\frac{2}{\sqrt{8a}}+\frac{3\sqrt{x-4a}\to 0}{(\sqrt{x}+\sqrt{4a})(\sqrt{x+4a})}\right)=\lim_{x\to 4a^+}\frac{2}{\sqrt{8a}}+0$$

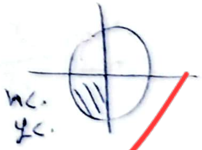
$\sqrt{8a}$

---

(10)

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

2



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

$$\lim\frac{1+2k}{0^+}=-\infty\to 1+2k<0\to k<-\frac{1}{2}$$

$$-1<k<-\frac{1}{2}$$

$$-\pi<k\pi<-\frac{\pi}{2}$$

$$-1<\cos k\pi<\cos-\frac{\pi}{2}$$

Scanned with CamScanner