Subject.
Date.

A دوازدهم — تکلیف چهار — پریا شکرگزار

۱۵٫۷۵

۱_

$$\lim_{x\to 2}\frac{2x-5}{x^2+ax+b}=-\infty \qquad a+b=?$$

۲

$2(2)-5=-1 \rightarrow x^2+ax+b \geq 0 \rightarrow$ مخرج همیشه از صفر و طرف مثبت است که ریشه مضاعف ۲ داشته باشد:

$(x-2)^2 \rightarrow x^2-4x+4 \rightarrow a=-4,\ b=4 \rightarrow \boxed{a+b=0}$ ✓

۲_

$$\lim_{x\to\sqrt[3]{4}}\frac{x^{\curvearrowright >0}}{x^2+ax+b}=+\infty \qquad \left[\frac{b}{a}\right]=?$$

$\rightarrow x^2+ax+b\geq 0 \rightarrow (x-\sqrt[3]{4})^2 = x^2+\sqrt[3]{16}-2\sqrt[3]{4}\,x$

۲

$a=-2\sqrt[3]{4},\ b=\sqrt[3]{16} \rightarrow \left[\frac{b}{a}\right]=\left[\frac{\sqrt[3]{16}}{-2\sqrt[3]{4}}\right]=\left[-\frac{1}{2}\times\underset{1,\ldots}{\sqrt[3]{4}}\right]=-1$ ✓

۳_ ۰٫۵

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

حاصل حد به $-\infty$ میل کرده ← مخرج به صفر میل می‌کند.

$\dfrac{-1+a}{\left|\frac{\sqrt{3}}{3}x+a\right|+a}$

$-1+a>0 \rightarrow a>1 \rightarrow \frac{\sqrt{3}}{3}x+2a<0 \rightarrow a<-\frac{2}{3}$ غ‌ق‌ق

$-1+a<0 \rightarrow a<1 \rightarrow \underbrace{\left|\frac{\sqrt{3}}{3}x+a\right|+a}_{+}>0$

$\lim_{x\to\left(\frac{1}{\sqrt{3}}\right)^+} = \left|\frac{\sqrt{3}}{3}x+a\right| = \left|\frac{1}{\sqrt{3}}\times\frac{\sqrt{3}}{3}+a\right|+a=0 \rightarrow \left|\frac{1}{3}+a\right|+a=0$

$\boxed{[a]=0} \leftarrow 0<a<1 \leftarrow a>0$

$\rightarrow \begin{cases} a\geq -\frac{1}{3} \rightarrow 2a+\frac{1}{3}=0 \rightarrow a=-\frac{1}{6} ✓ \\ a<-\frac{1}{3} \rightarrow -a-\frac{1}{3}+a=0 \ \times \end{cases} \rightarrow [a]=\left[-\frac{1}{6}\right]=-1$

Subject.

Date.

$$\lim_{x\to(-\frac{1}{2})^+} \frac{16x-[-\frac{2}{x^2}]}{24x+[\frac{3}{x^2}]} = \frac{16x+9}{24x+12} = \frac{1}{0^+} = +\infty$$ —4

1,75

$$\lim_{x\to 2^+} \frac{x^2-4}{x^3-[x^3]} = \frac{x^2-4}{x^3-8} = \frac{\cancel{(x-2)}(x+2)}{\cancel{(x-2)}(x^2+2x+4)} = \frac{x+2}{x^2+2x+4} = \frac{4}{12} = \frac{1}{3}$$ —5

2

$$\lim_{x\to -8} \frac{x^2+10x+16}{12+6\sqrt[3]{x}} = \frac{0}{0} \xrightarrow{Hop} \frac{2x+10}{\frac{6}{3\sqrt[3]{x^2}}} = \frac{-16+10}{\frac{6}{\underbrace{3\sqrt[3]{64}}_{4}}} = \frac{-6}{\frac{1}{2}} = -12$$ —6

2

$$\lim_{x\to 0^-} \frac{\sqrt{2+3x}-\sqrt{2-x}}{\sqrt{1-\cos x}} \times \frac{\sqrt{2+3x}+\sqrt{2-x}}{\sqrt{2+3x}+\sqrt{2-x}} = \frac{2+3x-2+x}{\sqrt{1-\underbrace{\cos x}_{\sim 1-\frac{x^2}{2}}}\times(\sqrt{2+3x}+\sqrt{2-x})}$$ —7

$$= \frac{4x}{\sqrt{1-(1-\frac{x^2}{2})}\times 2\sqrt{2}} = \frac{-4\sqrt{2}}{2\sqrt{2}} = -2$$

2

$$\lim_{x\to 0} \frac{k+\cos(\sqrt{a}x)}{kx^2} = 3 \qquad \frac{a}{k} = ? \qquad k+\cos(\sqrt{a}x)=0 \to k=-1$$ —8

1,5

$$\cos(\sqrt{a}x) \sim 1-\frac{ax^2}{2} \to \frac{\overset{-\frac{ax^2}{2}}{\cancel{\overset{-1}{k}+1}-\frac{ax^2}{2}}}{\overset{-1}{k}x^2} = 3 \to \frac{-\frac{x^2}{2}}{-x^2} = 3 \to$$

$$\lim_{x\to 0} \frac{\frac{-ax^2}{2}}{-x^2} = \frac{a}{2} \to \frac{a}{2} = 3 \to a = 6$$

$$\to -\frac{a}{2} = 3 \to a = -6 \qquad k=-1 \to \frac{a}{k} = 6$$

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

PAPCO

$$\lim_{x\to 3a^+} \frac{2\sqrt{x-3a}}{\sqrt{x-3a}\sqrt{x+3a}} + \frac{3\sqrt{x}-3\sqrt{3a}}{\sqrt{x-3a}\sqrt{x+3a}} = \lim_{x\to 3a^+}\left(\frac{2}{\sqrt{6a}} + \frac{3(\sqrt{x}-\sqrt{3a})}{\sqrt{x-3a}\sqrt{x+3a}}\times\frac{\sqrt{x}+\sqrt{3a}}{\sqrt{x}+\sqrt{3a}}\right)\to$$

$$\lim_{x\to 3a^+}\left(\frac{2}{\sqrt{6a}} + \frac{2(x-3a)}{(\sqrt{x-3a}\sqrt{x+3a})(\sqrt{x}+\sqrt{3a})}\right) = \lim_{x\to 3a^+}\left(\frac{2}{\sqrt{6a}} + \frac{3\sqrt{x-3a}\xrightarrow{}0}{(\sqrt{x}+\sqrt{3a})(\sqrt{x+3a})}\right) = \lim_{x\to 3a^+}\frac{2}{\sqrt{6a}} + 0$$

۰/۵ $\to \frac{\sqrt{4}}{\sqrt{6a}} = \sqrt{\frac{4}{6a}} = \boxed{\sqrt{\frac{2}{3a}}}$

Subject.

Date.

۹

$$\lim_{x\to(3a)^+} \frac{2\sqrt{x-3a}+3\sqrt{x}-\sqrt{27a}}{\sqrt{x^2-9a^2}} \quad \frac{0}{0} \quad \text{Hop}$$

$$\xrightarrow{\text{Hop}} \frac{\frac{2}{2\sqrt{x-3a}}+\frac{3}{2\sqrt{x}}}{\frac{2x}{2\sqrt{x^2-9a^2}}} = \frac{\frac{2\sqrt{x}+3\sqrt{x-3a}}{2\sqrt{x-3a}\sqrt{x}}}{\frac{2x}{2\sqrt{(x-3a)(x+3a)}}}$$

حل –

$$\lim_{x\to(-1)} \frac{1-k[x]}{x^2-1} = -\infty$$

$-1 \quad 1$; $+ \mid - \mid +$

$x\to(-1)^+ \to \dfrac{1+k}{\underbrace{x^2-1}_{-}} = -\infty \to 1+k>0 \to k>-1$

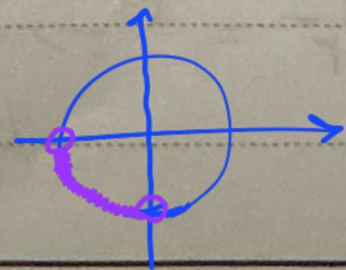
$-1<k<-\frac{1}{2}$

$x\to(-1)^- \to \dfrac{1+2k}{\underbrace{x^2-1}_{+}} = -\infty \to 1+2k<0 \to k<-\frac{1}{2}$

1,5

$(k\pi, \cos k\pi) \to$ ناحیه سوم و چهارم

$-1<k<-\frac{1}{2} \to \begin{cases} -\pi<k\pi<-\frac{\pi}{2} \\ -1<\cos k\pi<0 \end{cases}$



ناحیه سوم