کیانا سلطانی:

۱۸

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

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

ریشه مضاعف ۲ $= \Rightarrow x^2-4x+4 \Rightarrow b=4$

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② $\lim \frac{x}{x^2+ax+b} = +\infty \qquad \left[\frac{b}{a}\right] \qquad \frac{b \to \sqrt[3]{16}}{a \to -\sqrt[3]{32}} \Rightarrow \left[-\sqrt[3]{\frac{1}{2}}\right] \Rightarrow (-1)$

$x\to(\sqrt[3]{4})$

(ریشه مضاعف) $(x-\sqrt[3]{4})^2 \Rightarrow x^2 \underbrace{-2\sqrt[3]{4}}_{a}x + \underbrace{\sqrt[3]{4^2}}_{b}$

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③ $\lim_{x\to \frac{1}{\sqrt3}^+} \frac{[-x]+a}{\left|\frac{\sqrt3}{3}x+a\right|+a} \qquad \frac{-1+a}{\left|\frac{1}{3}^+ +a\right|+a} = -\infty$

$\left[\frac{-1}{\sqrt3}\right] = -1 \qquad \frac{\sqrt3}{3}^+$

۲

$\frac{1}{3}+2a=0 \Rightarrow a=\frac{-1}{6}$

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④ $\lim_{x\to -\frac{1}{2}^+} \frac{16x-\left[\frac{-2}{x^2}\right]}{24x+\left[\frac{3}{x^2}\right]} \Rightarrow \frac{-8}{-12+\left[\frac{3}{\frac{1}{4}}\right]} \simeq \frac{0}{0} \xrightarrow{HoP} \frac{16}{24} = \frac{2}{3}$

صفر صفر نیست!

با نامساوی حل کن که اشتباه نکنی!

۱٫۵

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⑤ $\lim_{x\to 2^+} \frac{x^2-4}{x^3-[x^3]} \simeq \frac{0}{0} \xrightarrow{HoP} \frac{2x}{3x^2} \Rightarrow \frac{4}{12} = \frac{1}{3}$

۲

$$\cdots \Rightarrow ۲(-۶) = -۱۲$$

۷) $$\lim \frac{\sqrt{۲+۳x}-\sqrt{۲-x}}{\sqrt{1-\cos x}} \quad \frac{0}{0} \Rightarrow \frac{\times\sqrt{1+\cos}}{\times\sqrt{1+\cos}} \Rightarrow \frac{\left(\sqrt{۲+۳x}-\sqrt{۲-x}\right)\sqrt{۲}}{|\sin|}$$

$$\Longrightarrow \frac{\sqrt{۲+۳x}-\sqrt{۲-x}\ \sqrt{۲}}{-\sin} \quad -\sin \simeq -x$$

تست سامان:

۴) $$\frac{۲\sqrt{x-۳a}+۳\sqrt{x}-\sqrt{۲۷a}}{\sqrt{x^۲-۹a^۲}}$$

(۱،۲۵)

$$\frac{۲}{\sqrt{x+۳a}} + \frac{۳\sqrt{x}-\sqrt{۲۷a}}{\sqrt{x^۲-۹a^۲}} \times \frac{\sqrt{x^۲+۹a^۲}}{\sqrt{x^۲+۹a^۲}}$$

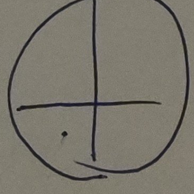
۱) $$\lim \frac{1-k[x]}{x^۲-1} = -\infty$$

$$x \to -1^- \quad \frac{1+۲k}{0^+} = -\infty \quad 1+۲k<0 \Rightarrow k<\frac{-1}{۲}$$

$$x \to -1^+ \quad \frac{1+k}{0^-} = -\infty \quad 1+k>0 \Rightarrow k>-1$$

$$-1<k<\frac{-1}{۲} \quad (k\pi, \cos k\pi) \Rightarrow \ominus, \ominus$$

۲



$$-\frac{۲}{۲}\pi$$ ✓

$\Longrightarrow$ ناحیه ۳

کیمیا سلطانی

۶) $\lim\limits_{x\to-8} \dfrac{x^{2}+10x+16}{12+6\sqrt[3]{x}} \;\tfrac{0}{0}\; \xrightarrow{HOP} \dfrac{2x+10}{\dfrac{6}{3\sqrt[3]{x^{2}}}} \Rightarrow 2(-6) = -12$

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۷) $\lim \dfrac{\sqrt{2+3x}-\sqrt{2-x}}{\sqrt{1-\cos x}} \;\tfrac{0}{0}\; \Rightarrow \dfrac{\times\sqrt{1+\cos}}{\times\sqrt{1+\cos}} \Rightarrow \dfrac{\left(\sqrt{2+3x}-\sqrt{2-x}\right)\sqrt{2}}{|\sin x|}$

$\xrightarrow[|\sin|=0^-]{} \dfrac{\sqrt{2+3x}-\sqrt{2-x}\;\sqrt{2}}{-\sin} \xrightarrow{-\sin\simeq -x} \dfrac{\left(\sqrt{2+3x}-\sqrt{2-x}\right)\sqrt{2}}{-x}$

$\xrightarrow[HOP]{} \dfrac{\sqrt{2}\left(\dfrac{3}{2\sqrt{2+3x}}-\dfrac{-1}{2\sqrt{2-x}}\right)}{-1} \Rightarrow -\sqrt{2}\left(\dfrac{3}{2\sqrt{2}}+\dfrac{1}{2\sqrt{2}}\right)$

$\Rightarrow -\cancel{\sqrt{2}}\,\dfrac{2}{\cancel{\sqrt{2}}} \Rightarrow -2$

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۸) $\lim\limits_{x\to 0} \dfrac{k+\cos(\sqrt{a}\,x)}{kx^{4}} = 3 \Rightarrow$

هم ارزی cos

۱/۲۵

$\xrightarrow[\cos\simeq 1-\frac{x^{2}}{2}]{} \dfrac{k+\left(1-\frac{x^{2}\sqrt{a}}{2}\right)}{kx^{2}} = 3 \Rightarrow \tfrac{0}{0} \xrightarrow{HOP} \dfrac{-\cancel{x}\sqrt{a}}{2k\cancel{x}} = 3$

$\dfrac{-\sqrt{a}}{2k} = 3 \quad ، \quad k+\sqrt{a} = 0$

-1

۴

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

$$\hookrightarrow -\frac{2}{x^2} < -8 \rightsquigarrow \left[-\frac{2}{x^2}\right] = -9$$

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

۵

چون حد مخرج برابر صفر است و حاصل حد عبارت حقیقی و غیر صفر است پس حد صورت نیز برابر صفر است!

$$\lim_{x \to 0} k + \cos(\sqrt{a}\, x) = 0 \rightarrow k+1 = 0 \rightarrow \boxed{k=-1}$$

$$\lim_{x \to 0} \frac{-1+\cos\sqrt{a}\, x}{-x^2} \overset{\text{هم‌ارزی}}{\rightsquigarrow} \lim_{x \to 0} \frac{-1+1-\frac{(\sqrt{a}x)^2}{2}}{-x^2} = \frac{-ax^2}{2(-x^2)} = \frac{a}{2}$$

$$\frac{a}{2} = 3 \rightarrow \boxed{a=6} \rightsquigarrow \frac{a}{k} = -6$$

۶

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

$$\lim_{x \to 3a^+} \frac{2}{\sqrt{6a}} + \frac{3(\cancel{x-3a})}{\cancel{\sqrt{x-3a}}\sqrt{x+3a}(\sqrt{x}+\sqrt{3a})} = \lim_{x \to 3a^+} \left(\frac{2}{\sqrt{6a}} + \frac{3\cancel{\sqrt{x-3a}}}{\sqrt{x+3a}(\sqrt{x}+\sqrt{3a})}\right) = \lim_{x \to 3a^+} \frac{2}{\sqrt{6a}} + 0 \rightsquigarrow \frac{2}{\sqrt{6a}} = \sqrt{\frac{4}{6a}} = \sqrt{\frac{2}{3a}}$$