۲۵ پرسین ایرانپور

Subject:
Year: Month: Day: page: ( )

۱- $2x-5 \xrightarrow{x\to 2} 2\times 2-5=-1<0 \Rightarrow x^2+ax+b = 0^+$

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

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۲- $x=\sqrt[3]{4} \Rightarrow x^2+ax+b=0^+ \quad (x-\sqrt[3]{4})^2 = x^2+ax+b$

$\Rightarrow a=-2\sqrt[3]{4} \quad b=\sqrt[3]{16} \quad [\frac{b}{a}] = \frac{\sqrt[3]{16}}{\sqrt[3]{-32}} = -1$ ✓

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۳- $x\to \frac{1}{\sqrt3}^+ \Rightarrow \frac{\sqrt3}{3}\times x = \frac{\sqrt3}{3}\times\frac{1}{\sqrt3} = \frac{1}{3}^+ \qquad \frac{a-1}{|\frac13+a|+a} = -\infty$

$[-x] = [-\frac{1}{\sqrt3}^-] = -1$

① $a<-\frac13 \Rightarrow \frac{a-1}{-\frac13-a+a} = \frac{a-1}{-\frac13} = -\infty$ نمی‌شود پس است منفی نیز a

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② $a>-\frac13 \quad \frac{a-1}{\frac13+2a} = -\infty \Rightarrow \frac13+2a = 0^+ \Rightarrow a=(-\frac16)^+ \Rightarrow [a] = [-\frac16^+] = -1$ ✓

۴- $x\to -\frac12 \Rightarrow x^2 < \frac14 \Rightarrow \frac{1}{x^2} > 4 \Rightarrow \frac{-2}{x^2} < -8 \Rightarrow [\frac{-2}{x^2}] = -9$

$\frac{3}{x^2} > 12 \Rightarrow [\frac{3}{x^2}] = 12$

$\lim \frac{16x-[\frac{-2}{x^2}]}{24x+[\frac{3}{x^2}]} = \frac{-8+9}{-12^+ +12} = \frac{1}{0^+} = \infty$ ✓

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۵- $\lim_{x\to 2^+} \frac{x^2-4}{x^3-\cancel{[x^3]}_{8}} = \frac{2x}{3x^2} = \frac{4}{12} = \frac13$ ✓

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۶- $\lim_{x\to -8} \frac{x^2+10x+16}{12+6\sqrt[3]{x}} = \frac{2x+10}{6\frac{1}{3\sqrt[3]{x^2}}} = \frac{-6}{6\times\frac{1}{12}} = \frac{-6}{\frac12} = -12$ ✓

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

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$= \frac{\overbrace{(2+3x-(2-x))}^{4x}(\sqrt{1+\cos x})}{(\sqrt{1-\cos^2 x})(\sqrt{2+3x}+\sqrt{2-x})} = \frac{-4\sqrt2}{2\sqrt2} = -2$ ✓

Arman

$= \sqrt{\sin^2 x} = |\sin x| = -\sin x = -x$

۸ $\cos x \underset{x\to 0}{\sim} 1-\dfrac{x^۲}{۲} \qquad \cos\sqrt{a}\,x \sim 1-\dfrac{a x^۲}{۲}$

$\lim\limits_{x\to 0} \dfrac{k+\cos(\sqrt{a}\,x)}{k x^۲} = \dfrac{k+1-\frac{a x^۲}{۲}}{k x^۲} = ۳ \Rightarrow k+1=0 \Rightarrow k=-1$

$\Rightarrow \dfrac{\frac{-a x^۲}{۲}}{-x^۲} = \dfrac{a}{۲} = ۳ \Rightarrow a=۶ \qquad \dfrac{a}{k} = -۶$

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۹ $\lim\limits_{x\to ۳a^+} \dfrac{۲\sqrt{x-۳a} + ۳\sqrt{x} - \sqrt{۲۷a}}{\sqrt{x^۲-۹a^۲}} = \lim\limits_{x\to ۳a^+} \dfrac{۲\sqrt{x-۳a}}{\sqrt{x^۲-۹a^۲}} + \dfrac{۳\sqrt{x}-۳\sqrt{۳a}}{\sqrt{x^۲-۹a^۲}} = \dfrac{0}{0}$

$= \dfrac{۲\sqrt{x-۳a}}{\sqrt{x-۳a}\sqrt{x+۳a}} + \dfrac{۳\sqrt{x}-۳\sqrt{۳a}}{\sqrt{x-۳a}\sqrt{x+۳a}} \times \dfrac{\sqrt{x}+\sqrt{۳a}}{\sqrt{x}+\sqrt{۳a}} = \dfrac{۲}{\sqrt{x+۳a}} + \dfrac{۳(x-۳a)}{\sqrt{x-۳a}\sqrt{x+۳a}(\sqrt{x}+\sqrt{۳a})}$

$= \dfrac{۲}{\sqrt{x+۳a}} + \dfrac{۳\sqrt{x-۳a}}{\sqrt{x+۳a}(\sqrt{x}+\sqrt{۳a})} = \dfrac{۲}{\sqrt{۶a}} + 0 = \dfrac{۲}{\sqrt{۶a}}$

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$\lim\limits_{x\to -1} \dfrac{1-k[x]}{x^۲-1} = -\infty$

$x\to -1^+ : \lim\limits_{x\to -1^+} \dfrac{1+k}{x^۲-1} = \dfrac{1+k}{0^-} = -\infty \Rightarrow 1+k>0 \Rightarrow k>-1$ ۱۰

$x\to -1^- : \lim\limits_{x\to -1^-} \dfrac{1+۲k}{x^۲-1} = \dfrac{1+۲k}{0^+} = -\infty \Rightarrow 1+۲k<0 \Rightarrow ۲k<-1$

$k<-\dfrac{1}{۲}$

$\Rightarrow -1<k<-\dfrac{1}{۲} \Rightarrow -\pi<k\pi<-\dfrac{\pi}{۲}$

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