آیلا میرونیا

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۱. چون جواب در هر دو بین ریشه مضاعف دارد $x^2+ax+b=0$

$(x-2)^2 = x^2-4x+4 \Rightarrow a=-4 \,/\, b=4$

$a+b = -4+4=0$ ✓

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۲. ریشه مضاعف داشته $x^2+ax+b=0$

$(x-\sqrt[3]{2^2})^2 = x^2 \underbrace{-2\sqrt[3]{2^2}}_{=a}\,x + \underbrace{2\sqrt[3]{2}}_{=b}$

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

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۳. $\lim\limits_{x\to(\frac{1}{\sqrt3})^-} \frac{[-x]+a}{|\frac{\sqrt3}{3}x+a|+a} = -\infty$ $\quad [-x] = [-\frac{\sqrt3}{3}] = -1$

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$|\frac{\sqrt3}{3}(\frac{\sqrt3}{3})+a|+a=0 \rightarrow \frac{1}{3}+a+a=0 \rightarrow 2a=\frac{-1}{3} \rightarrow a=\frac{-1}{6}$

$-\frac{1}{3}-a+a=0$ غ ق ق

$[a] = [\frac{-1}{6}] = -1$ ✓

۴. $\lim\limits_{x\to(-\frac{1}{2})^+} \frac{14x-[-\frac{2}{x^2}]}{24x+[\frac{3}{x^2}]} \longrightarrow -8-(-9)=1$ ~ صورت $\neq 0$

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

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

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$-12+12=0 \sim 0^+$

$\longrightarrow \frac{1}{0^+} = +\infty$ ✓

Date: / / Subject:

آیلا [illegible]

۵. $\lim\limits_{x\to 2^+} \dfrac{x^2-4}{x^3-[x^3]}$

$[x^3] = [2^{+3}] = [8^+] = 8$

$\dfrac{\cancel{(x-2)}(x+2)}{\cancel{(x-2)}(x^2+4+2x)} = \dfrac{x+2}{x^2+4+2x} = \dfrac{4}{12} = \dfrac{1}{3}$

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۶. $\lim\limits_{x\to -8} \dfrac{x^2+10x+16}{12+6\sqrt[3]{x}} \overset{Hop}{=} \dfrac{2x+10}{6\,\dfrac{1}{3\sqrt[3]{x^2}}} = \dfrac{(2x+10)(3\sqrt[3]{x^2})}{6}$

$= \dfrac{-6\times 12}{6} = -12$

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۷. $\lim\limits_{x\to 0^-} \dfrac{\sqrt{2+3x}-\sqrt{2-x}}{\sqrt{1-\cos x}} \times \dfrac{\sqrt{1+\cos x}}{\sqrt{1+\cos x}} \times \dfrac{\sqrt{2+3x}+\sqrt{2-x}}{\sqrt{2+3x}+\sqrt{2-x}} =$

$\dfrac{\overbrace{2+3x-2+x}^{4x}}{\underbrace{-\sin x}_{-x}} \times \dfrac{\sqrt{1+\cos x}}{\sqrt{2+3x}+\sqrt{2-x}} = -4\times\dfrac{\sqrt{2}}{2\sqrt{2}} = -2$

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۸. $\lim\limits_{x\to 0} \dfrac{k+\cos(\sqrt{a}\,x)}{kx^2} = 3 \overset{Hop}{=} \dfrac{-\sqrt{a}\,\overbrace{\sin\sqrt{a}\,x}^{\sqrt{a}\,x}}{2kx}$

$= \dfrac{-\sqrt{a}\times\sqrt{a}\,\cancel{x}}{2k\cancel{x}} = \dfrac{-a}{2k} = 3 \Rightarrow -a = 6k \to a = -6k$

$\dfrac{a}{k} = \dfrac{-6k}{k} = -6$

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آیلا فیروزنیا

۹.

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

$$\sqrt{(x+3a)}\times\sqrt{x-3a}$$

$$\text{Hop}\left(\frac{1}{\sqrt{x-3a}}+\frac{3}{2\sqrt{x}}\right)\times\frac{\sqrt{x^2-9a^2}}{x} = \left(\frac{1}{\sqrt{x-3a}}+\frac{3}{2\sqrt{x}}\right)\left(\frac{\sqrt{x-3a}\sqrt{x+3a}}{x}\right)$$

$$=\left(\frac{\sqrt{x+3a}}{x}\right)\left(1+\frac{3\cancel{\sqrt{x-3a}}}{2\sqrt{x}}\right) = \frac{\sqrt{6a}}{3a}\times 1 = \frac{2}{\sqrt{6a}}$$

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۱۰.

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

-1^-: $\frac{1+k}{x^2-1} = \frac{1+k}{0^-} = -\infty \to k>-1$

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

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

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