۱۲,۵

نوید زنده دل

$\lim_{x \to 2} (2x-5) = 4-5 = -1 \Rightarrow x^2+ax+b = (x-2)^2 = x^2-4x+4 \Rightarrow a+b = -4+4 = 0$ ۱-

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$x \to \sqrt[3]{4} = \sqrt[3]{4} \Rightarrow x^2+ax+b = (x-\sqrt[3]{4})^2 = x^2 - 2\sqrt[3]{4}\,x + \sqrt[3]{16} \Rightarrow \left[\frac{b}{a}\right] = \left[\frac{\sqrt[3]{16}}{-2\sqrt[3]{4}}\right] = \left[\frac{\sqrt[3]{16}}{-\sqrt[3]{128}}\right] = \left[-\frac{1}{\sqrt[3]{2}}\right] = -1$ ۲-

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$\lim_{x \to \left(\frac{1}{\sqrt{3}}\right)^+} \frac{\left[-\frac{1}{\sqrt{3}}\right]+a}{\left|\sqrt{3}a \cdot \frac{1}{\sqrt{3}} + a\right| + a} = -\infty \Rightarrow \frac{a-1}{\left|a+\frac{1}{3}\right|+a} = -\infty$ ۳-

$a<0 \to \frac{a-1}{-\frac{1}{3}}$

$a>0 \to \frac{a-1}{2a+\frac{1}{3}}$

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

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سوال ۴

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

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

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

سوال ۶

$$\lim_{x\to -8} \frac{x^2+10x+16}{12+6\sqrt[3]{x}} = \lim_{x\to -8} \frac{(x+8)(x+2)}{6(2+\sqrt[3]{x})} \times \frac{\sqrt[3]{x^2}+4-2\sqrt[3]{x}}{\sqrt[3]{x^2}+4-2\sqrt[3]{x}} \rightarrow$$

$$\lim_{x\to -8} \frac{(x+8)(x+2)\times 12}{6(x+8)} \longrightarrow \lim_{x\to -8} \frac{12(x+2)}{6} = 2\times(-6) = -12$$

۴ـ

$$\Rightarrow \frac{16x+3\left[\cancel{+\frac{1}{x^2}}\right]}{14+3\left[\frac{1}{x^2}\right]} = \frac{3\left(8x+\cancel{\left[\frac{+1}{x^2}\right]}\right)}{3\left(8x+\cancel{\left[\frac{1}{x^2}\right]}\right)} = \frac{3}{3}$$

۵ـ

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

$$= \frac{2x}{3x^2} = \frac{4}{12} = \frac{1}{3}$$ ✓

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۶ـ

$$\Rightarrow \frac{2x+10}{9x^{2/3}} = \frac{2x+10}{3x^{2/3}} \Rightarrow \lim_{x\to -8} \frac{2x+10}{3x^{2/3}} = \frac{-6}{3\sqrt[3]{64}} = \frac{-6}{3\times 4} = -\frac{3}{4}$$

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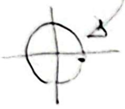
۷ـ

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



$$\sqrt{1-\cos x} \longrightarrow \text{ریشه } \frac{x^2}{2}$$

$$\Rightarrow \lim_{x\to 0^-} \frac{\sqrt{2+3x}-\sqrt{2-x}}{\sqrt{\frac{x^2}{2}}} \longrightarrow \frac{\sqrt{2+3(0)}-\sqrt{2-(0)}}{\;} \qquad \sqrt{\frac{x^2}{2}} \xrightarrow{x\to 0^-} = \frac{+x}{\sqrt{2}} = \frac{-x}{\sqrt{2}}$$

$$f'(0) = \frac{3}{2\sqrt{2+3x}} - \frac{-1}{2\sqrt{2-x}} \Rightarrow \frac{4}{2\sqrt{2}} = \sqrt{2} \Rightarrow \frac{x\sqrt{2}}{-\frac{x}{\sqrt{2}}} = -2$$

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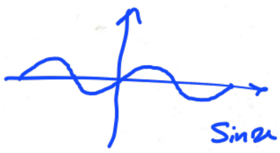
سوال ۷

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

$$\lim_{x\to 0^-} \frac{4x\times\sqrt{2}}{|\sin x|\times 2\sqrt{2}} = \lim_{x\to 0^-} \frac{4x\times\sqrt{2}}{-2\sqrt{2}\sin x} \xrightarrow{\text{فشردگی}} \lim_{x\to 0^-} \underbrace{\frac{x}{\sin x}}_{1} \times \frac{4\sqrt{2}}{-2\sqrt{2}} = -2$$



$$\lim_{x\to 0}\frac{k+1-\cancel{\frac{ax^2}{2}}}{kx^2}=3 \Rightarrow \cancel{\frac{2k+2-ax^2}{2kx^2}}=3 \overset{hop}{\Rightarrow} \lim_{x\to 0}\frac{-2ax}{4kx} \overset{hop}{\Rightarrow} \lim_{x\to 0}\frac{-\cancel{2}a}{\cancel{4}_2 k}=3-8$$

$$\Rightarrow a/k = 3\times 2\times -1=-6$$

2

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

$$\Rightarrow 3\sqrt{x}-3\sqrt{3a}=\frac{(x-3a)^3}{\sqrt{3a}+\sqrt{x}}$$

1,5

$$\Rightarrow \frac{\cancel{\frac{(x-3a)^3}{\sqrt{3a}+\sqrt{x}}}+2\sqrt{x-3a}}{\sqrt{(x+3a)(x-3a)}} \Rightarrow \frac{\left(\sqrt{x-3a}\right)\left(\frac{\left(\sqrt{x-3a}\right)^3}{\sqrt{3a}+\sqrt{x}}\right)}{\sqrt{(x+3a)(x-3a)}} \Rightarrow 2/\sqrt{\ }$$

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

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

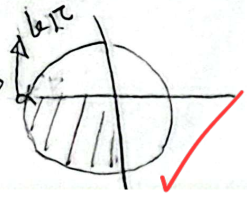
$$x\to -1^+\quad \frac{1+k}{0^-}=-\infty \Rightarrow k+1>0 \Rightarrow k>-1$$

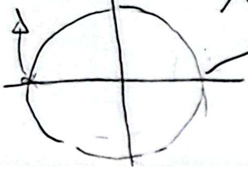
$$x\to -1^-\quad \frac{1+2k}{0^+}=-\infty \Rightarrow 2k+1<0 \Rightarrow 2k<-1 \Rightarrow k<-1/2$$

$$\Rightarrow -1<k<-1/2$$

2

$\cos -\pi=-1$

$\Rightarrow$ 



$\cos -\pi/2=0$