

① $\lim_{x \rightarrow 2} \frac{2x-5}{x^2+ax+b} \xrightarrow{x=2} \frac{-1}{x^2+ax+b} \rightarrow$ صفر عدد - پس مجموع صفر عدد
 بوده ✓
 صفر جواب - است و ضرورت -
 و صفر عدد در است برابر صفر پس مجموع صفر عدد دارد

② $\lim_{x \rightarrow \sqrt[3]{4}} \frac{x}{x^2+ax+b} \xrightarrow{x \rightarrow \sqrt[3]{4}} \frac{\sqrt[3]{4}}{x^2+ax+b} \xrightarrow{x \rightarrow \sqrt[3]{4}} \frac{\sqrt[3]{4}}{x^2+ax+b}$
 صفر + صفر پس مجموع صفر عدد در است برابر صفر پس مجموع صفر عدد است ✓
 $(x - \sqrt[3]{4})^2 \rightarrow x^2 - 2x\sqrt[3]{4} + 4 \rightarrow a = -2\sqrt[3]{4}, b = 4$
 $\Rightarrow \left[\frac{\sqrt[3]{4}}{x^2+ax+b} \right] \rightarrow 0$

③ $\lim_{x \rightarrow (\frac{1}{\sqrt{3}})^+} \frac{[-x] + a}{|\frac{\sqrt{3}}{3}x + a| + a} \xrightarrow{x = \frac{1}{\sqrt{3}}} \frac{[-\frac{1}{\sqrt{3}}] + a}{|(\frac{\sqrt{3}}{3} \cdot \frac{1}{\sqrt{3}}) + a| + a} = \frac{a-1}{\frac{1}{3} + a + a}$
 اگر منفی باشد -
 نخواهد شد
 $\frac{1}{3} + a > 0 \rightarrow a > -\frac{1}{3} \rightarrow \frac{a-1}{\frac{1}{3} + 2a} \rightarrow \frac{1}{3} + 2a = 0 \rightarrow a = -\frac{1}{4}$

$\Rightarrow [-\frac{1}{4}] = (-1)$

④ $\lim_{x \rightarrow (-\frac{1}{4})^+} \frac{14x - [-\frac{1}{4}]}{14x + [\frac{3}{4}]} \xrightarrow{x \rightarrow (-\frac{1}{4})^+} \frac{14x - [-\frac{1}{4}]}{14x + [\frac{3}{4}]}$
 $\frac{3}{4} > 12 \rightarrow \frac{1}{4} > 4 \leftarrow x^2 < \frac{1}{4} \leftarrow x > -\frac{1}{2} \neq$
 $\frac{14x - [-\frac{1}{4}]}{14x + [\frac{3}{4}]} \rightarrow \frac{14x + \frac{1}{4}}{14x + \frac{3}{4}} \xrightarrow{x \rightarrow (-\frac{1}{4})^+} \frac{14(-\frac{1}{4}) + \frac{1}{4}}{14(-\frac{1}{4}) + \frac{3}{4}} = \frac{-\frac{14}{4} + \frac{1}{4}}{-\frac{14}{4} + \frac{3}{4}} = \frac{-\frac{13}{4}}{-\frac{11}{4}} = \frac{13}{11}$

$$\lim_{x \rightarrow 2^+} \frac{x^2 - 4}{x^3 - [x^3]} \rightarrow \frac{x^2 - 4}{x^3 - 1} \quad (x \rightarrow 2^+ \Rightarrow x^3 \rightarrow 8) \quad \text{لعمري}$$

$$\frac{x^3 > 1 \leftarrow x > 2}{}$$

$$\frac{0}{0} \rightarrow \frac{(x/2)(x+2)}{(x/2)(x^2+2x+4)} \xrightarrow{x=2} \frac{4}{12} = \frac{1}{3}$$

$$\lim_{x \rightarrow -1} \frac{x^3 + 10x + 19}{12 + 9\sqrt[3]{x}} \xrightarrow{x=-1} \frac{0}{0} \xrightarrow{\text{رفع الجذر}} \frac{(x+1)(x+1)}{12 + 9\sqrt[3]{x}} \cdot \frac{(x+1)(x+1)}{4(2+\sqrt[3]{x})}$$

$$\rightarrow \frac{(x+1)(\sqrt[3]{x}+1)(\sqrt[3]{x^2}+1-2\sqrt[3]{x})}{4(2+\sqrt[3]{x})} \xrightarrow{x=-1} \frac{(-9)(12)}{4} = -12$$

$$\lim_{x \rightarrow 0^-} \frac{\sqrt{2+3x} - \sqrt{2-x}}{\sqrt{1-\cos x}} \xrightarrow{x=0} \frac{0}{0} \xrightarrow{\text{رفع الجذر}} \cos x \sim 1 - \frac{x^2}{2}$$

$$\rightarrow \frac{\sqrt{2+3x} - \sqrt{2-x}}{\sqrt{\frac{x^2}{2}}} \cdot \frac{\sqrt{2+3x} + \sqrt{2-x}}{\sqrt{2+3x} + \sqrt{2-x}} = \frac{2+3x - 2+x}{(\sqrt{2+3x})(\sqrt{2-x})(1+\frac{\sqrt{2}}{2})} = \frac{2}{(\sqrt{2+3x})(\sqrt{2-x})(1+\frac{\sqrt{2}}{2})}$$

$$\xrightarrow{x=0} \frac{2}{(-\frac{\sqrt{2}}{2})(\sqrt{2})(\sqrt{2})} = -\frac{1}{\sqrt{2}}$$

$$\lim_{x \rightarrow 0} \frac{k + \cos(\sqrt{a}x)}{kx^2} = \mu \xrightarrow{x=0} \frac{k+1}{0} = \mu \rightarrow k+1=0$$

$$\rightarrow k = -1 \rightarrow \frac{-1 + \cos \sqrt{a}x}{-x^2} \sim \left[\cos \theta \sim 1 - \frac{\theta^2}{2} \right]_{\theta \rightarrow 0}$$

$$\rightarrow \frac{-1 + 1 - \frac{ax^2}{2}}{-x^2} \rightarrow \frac{\frac{-ax^2}{2}}{-x^2} = \frac{a}{2} = \mu \rightarrow a = 4$$

$$\rightarrow \frac{a}{2} \rightarrow \frac{4}{2} = 2$$

$$\lim_{x \rightarrow (\sqrt{3}a)^+} \frac{2\sqrt{x-3a} + 3\sqrt{x} - \sqrt{27a}}{\sqrt{x^2-9a^2}} \rightarrow \frac{2\sqrt{x-3a} + 3(\sqrt{x} - \sqrt{3a})}{(\sqrt{x-3a})(\sqrt{x+3a})} \quad (9)$$

$$\rightarrow \frac{1}{\sqrt{9a}} \left(\frac{2\sqrt{x-3a} + 3(\sqrt{x} - \sqrt{3a})}{\sqrt{x-3a}} \right) \rightarrow \frac{1}{\sqrt{9a}} \left(\frac{2\sqrt{x-3a}}{\sqrt{x-3a}} + \frac{3(\sqrt{x} - \sqrt{3a})}{\sqrt{x-3a}} \right) = \frac{2}{\sqrt{9a}} + \frac{3(\sqrt{x} - \sqrt{3a})}{\sqrt{9a}\sqrt{x-3a}}$$

همراه از صفر است و هم از زیر کم تر است
حقیقی

$$\lim_{x \rightarrow (-1)} \frac{1 - K[x]}{x^2 - 1} \rightarrow (-1)^+ \rightarrow \frac{1+K}{(x-1)} \xrightarrow{z \rightarrow \infty} 1+K > 0$$

$$\rightarrow (-1)^- \rightarrow \frac{1+2K}{(x-1)} \xrightarrow{z \rightarrow \infty} 1+2K < 0$$

نتیجه: $x \rightarrow -1 \rightarrow (-2)$

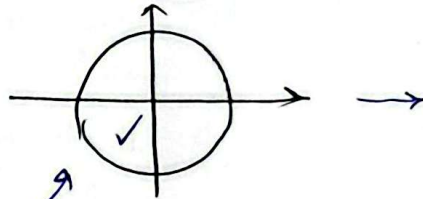
$K > -1$

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

$$\rightarrow \left(-1 < K < -\frac{1}{2} \right)$$

$$(K\pi, \cos K\pi)$$

$$-1 < \cos K\pi < 0$$



ناقص 3