فاطمه رحیمیان - دوازدهم ۳ تجربی -

سوال ۱

$$\lim_{x \to 2} \frac{2x-5}{x^2+ax+b} = -\infty \qquad \frac{-1}{0^+} = -\infty$$

این ریشه مضاعف است

$$(x-2)^2 = x^2 - 4x + 4 \qquad a = -4 \quad b = 4$$

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

سوال ۲

$$\lim_{x \to 2\sqrt{2}} \frac{x}{x^2+ax+b} = +\infty \qquad \frac{2\sqrt{2}}{0^+} = +\infty$$

ریشه مضاعف

$$(x - 2\sqrt{2})^2 = x^2 - 4\sqrt{2}\,x + 2\sqrt{16}$$

$$a = -2 \times 2\sqrt{2} \qquad b = 2\sqrt{16}$$

$$\left[\frac{b}{a}\right] = \left[\frac{2\sqrt{16}}{-4\sqrt{2}}\right] = \left[-\sqrt{\frac{4}{8}}\right] = -1$$

سوال ۳

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

$$a - 1 < 0 \rightarrow \boxed{a < 1}$$

سوال ۸

$$\lim_{x \to (-\frac{1}{2})^+} \frac{16x - [-\frac{2}{x^2}]}{24x + [\frac{3}{x^2}]}$$

$$x > -\frac{1}{2} \to \frac{1}{x} < -2 \to \frac{1}{x^2} > 4 \to -\frac{2}{x^2} < -8$$

$$[-\frac{2}{x^2}] = -9$$

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

$$\lim_{-\frac{1}{2}^+} \frac{16x + 9}{24x + 12} = \frac{1}{0^+} = +\infty$$

سوال ۷

$$\lim_{x \to 2^+} \frac{x^2 - 4}{x^3 - [x^3]}$$

$$[x^3] = [8^+] = 8$$

$$\frac{x^2 - 4}{x^3 - 8} = \frac{(\cancel{x-2})(x+2)}{(\cancel{x-2})(x^2+2x+4)}$$

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

سوال ۹

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

$$\frac{(x+2)(\cancel{2+\sqrt[3]{x}})(4 + \sqrt[3]{x^2} - 2\sqrt[3]{x})}{6(\cancel{2+\sqrt[3]{x}})}$$

$$\frac{-6(4+4+4)}{6} = -12$$

سوال ۷

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

$$\lim_{x\to 0^-} = \cancel{2}+3x-\cancel{2}+x = \frac{4x}{(\sqrt{1-\cos})(\sqrt{2+3\cancel{x}}+\sqrt{2-\cancel{x}})}$$

$$\frac{4x}{\sqrt{1-\cos}\times 2\sqrt{2}}$$

سوال ۸

$$\lim_{x\to 0} \frac{k+\cos(\sqrt{a}\,x)}{kx^2} = 2$$

$$\cos\sqrt{a}\,x = 1-\frac{(\sqrt{a}\,x)^2}{2} = 1-\frac{ax^2}{2}$$

$$\lim \frac{k+1-\frac{ax^2}{2}}{kx^2} = 2 \rightarrow \frac{-a\cancel{x^2}}{2k\cancel{x^2}} = 2$$

$$-\frac{a}{2k} = 2 \rightarrow \boxed{\frac{a}{k} = -4}$$

حل ۹۷b

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

کسر را تفکیک

$$\frac{2\cancel{\sqrt{x-3a}}}{\cancel{\sqrt{x-3a}}\times\sqrt{x+3a}}+\frac{3\sqrt{x}-3\sqrt{3a}}{\sqrt{x-3a}\times\sqrt{x+3a}}$$

$$\frac{2}{\sqrt{x+3a}}+\frac{3(\sqrt{x}-\sqrt{3a})}{\sqrt{x^2-9a}}\times\frac{\sqrt{x}+\sqrt{3a}}{\sqrt{x}+\sqrt{3a}}$$

$$3\left(\frac{x-3a}{\sqrt{x^2-9a}\,(\sqrt{x}+\sqrt{3a})}\right)$$

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

$0 \to 0$

$$\frac{2}{\sqrt{3a+3a}}=\frac{2}{\sqrt{6a}}$$

سوال ۱۰

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

$(k\pi, \cos k\pi)$

$-1^+ \to -0.9$

$$\frac{1+k}{\underbrace{x^2-1}_{0^-}} = -\infty \qquad \frac{1+k}{0^-} = -\infty$$

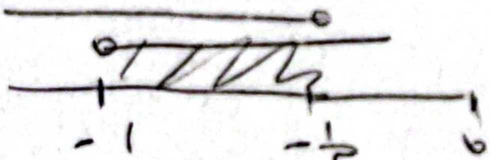
$1 + k > 0 \Rightarrow \boxed{k > -1}$

$-1^- \quad -1.1$

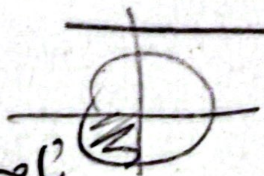
$$\frac{1+2k}{\underbrace{x^2-1}_{0^+}} = -\infty$$

$1 + 2k < 0$

$2k < -1 \Rightarrow \boxed{k < -\frac{1}{2}}$



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



ناحیه سوم