

سوال ۲

۲.  آینه

NOTE:

DATE:

SUBJECT:

$$f(x) = x \left[\frac{x-a}{x} \right] + a \left[\frac{x+a}{x} \right] \xrightarrow{\text{در صورت } x \neq 0} x \left[\frac{x-(-x)}{x} \right] + a \left[\frac{-x^2+x}{x} \right] = x \left[\frac{x^2}{x} \right] + a \left[\frac{-x^2+x}{x} \right]$$

$$-x-a = x \Rightarrow a = -x \Rightarrow \left[\frac{a}{x} \right] = \left[\frac{-x}{x} \right] = -1 \quad \checkmark$$

$$\lim_{x \rightarrow \left(\frac{1}{x}\right)^-} [x \sin x - 1] = \left[x \left(\frac{1}{x} \right) - 1 \right] = [1 - 1] = [0] = [-1] \quad \checkmark$$

$$\lim_{x \rightarrow \frac{1}{x}} [12x^2 - 2] = \left[12 \left(\frac{1}{x} \right)^2 - \left(-\frac{1}{x} \right) \right] = \left[-\frac{1}{x} \right] = -1 \quad \checkmark$$

$$\lim_{x \rightarrow \left(-\frac{1}{x}\right)^-} \frac{10x - \omega + \left[\frac{x}{x}\right]}{14x - \left[-\frac{x}{x}\right]} = \lim_{x \rightarrow \left(-\frac{1}{x}\right)^-} \frac{10x - \omega + [x]}{14x - [-1]} = \frac{-\omega + 4}{0} = -\infty \quad \checkmark$$

$$\lim_{x \rightarrow 1^+} \frac{\sin^2 \pi x}{[x] + \cos \pi x} = \lim_{x \rightarrow 1^+} \frac{1 - \cos^2 \pi x}{1 + \cos \pi x} = \lim_{x \rightarrow 1^+} \frac{1 - \cos \pi}{1 + \cos \pi} = \frac{1 - (-1)}{1 + (-1)} = 1 \quad \checkmark$$

$$\lim_{x \rightarrow -1} \frac{\sqrt{x+1} - \sqrt{x+1}}{1+x} \xrightarrow{\text{HOP}} \lim_{x \rightarrow -1} \frac{\frac{x}{\sqrt{x+1}} - \frac{x}{\sqrt{x+1}}}{1} = \frac{1-x}{1} = 0 \quad \checkmark$$

$$\lim_{x \rightarrow 1} \frac{x^2 - \sqrt{x+1}}{x^2 - \sqrt{x+1}} \div \lim_{x \rightarrow 1} \frac{(\sqrt{x+1} - 1)(\sqrt{x+1} + 1)}{x^2 - \sqrt{x+1}} \times \frac{x^2 + \sqrt{x+1}}{x^2 + \sqrt{x+1}} = \lim_{x \rightarrow 1} \frac{x(\sqrt{x+1} - 1)}{(\sqrt{x+1} + 1)(x^2 + 1)} = -1/2 \quad \checkmark$$

$$\lim_{x \rightarrow 1} \frac{(\sqrt{x+1} - 1)(\sqrt{x+1} + 1)}{(\sqrt{x+1} + 1)(x^2 + 1)} = \lim_{x \rightarrow 1} \frac{x(\sqrt{x+1} - 1)}{(\sqrt{x+1} + 1)(x^2 + 1)} = -1/2 \quad \checkmark$$

1- $\lim_{x \rightarrow 0} \frac{a + \sqrt{bx+c}}{x} = \frac{1}{r}$ مخرج به سمت منفی رفته برای اینکه جواب داشته باشد صورت $x=0$ صفر میل کند

$a + \sqrt{c} = 0 \Rightarrow a = -\sqrt{c}$ I
 $a' = -c$ II

$$\frac{a + \sqrt{bx+c}}{x} \times \frac{a + \sqrt{bx+c}}{a + \sqrt{bx+c}} = \frac{a^2 - bx - c}{(x)(a + \sqrt{bx+c})}$$

$\frac{-bx}{x(a)} = \frac{-b}{a} = \frac{1}{r} \Rightarrow b = \frac{a}{r}$ $b = \sqrt{c}$ $b = \frac{\sqrt{c}}{r}$

$\frac{ab}{c} = \frac{-\sqrt{c} \frac{\sqrt{c}}{r}}{c} = \frac{-\frac{c}{r}}{c} = -\frac{1}{r}$ ✓

$\lim_{x \rightarrow -r \pm \sin x} \frac{r + K[\frac{x}{r}]}{x} = +\infty$

مخرج به عددی صورت و مخرج هم ثابت

$x > -r \Rightarrow \frac{x}{r} > -1 \Rightarrow [\frac{x}{r}] = -1$

$x < -r \Rightarrow \frac{x}{r} < -1 \Rightarrow [\frac{x}{r}] = -2$

$\sin x > 0 \Rightarrow x < 0$ در راست

$\frac{r+K}{0^+} \rightarrow +\infty \Rightarrow r+K > 0 \Rightarrow K > -r$ I

$\frac{r-3}{0^-} \rightarrow +\infty \Rightarrow r-3 < 0 \Rightarrow K < \frac{r}{3}$ II

$[-K] = -r$

10- $\lim_{x \rightarrow 1} \frac{b\sqrt{x} + \sqrt{x} - b}{ax-b} = \frac{1}{r}$ صورت مخرج به صفر میل کند $a-b=0 \Rightarrow b=a$

$\lim_{x \rightarrow 1} \frac{1a(\sqrt{x} + \sqrt{x} - 1)}{ax - 1a} \times \frac{1}{1} = \lim_{x \rightarrow 1} \frac{1a(\sqrt{x} - 1)}{a(x-1)} \times \frac{1}{1} = \lim_{x \rightarrow 1} \frac{1(x-1)}{(x-1)a} = \frac{1}{a}$