

دو از هم بیرون

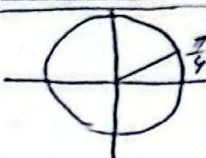
تکلیف شماره ۱۹

۲۰ کار آزاد

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

$\Rightarrow 1 - a = 2a = 1$

$$\lim_{x \rightarrow -1^-} x \left[\frac{x-1}{x} \right] + a \left[\frac{x+1}{x} \right] = x \left[1 \right] + a \left[\frac{0}{-1} \right] = 1 - a \quad \left[\frac{a}{-1} \right], \left[\frac{1}{-1} \right] \checkmark \quad (2)$$

$$\lim_{x \rightarrow (\frac{\pi}{4})^-} [x \sin x - 1] \xrightarrow{\sin \frac{\pi}{4} = \frac{1}{\sqrt{2}}} [x(\frac{1}{\sqrt{2}}) - 1], [1 - 1] = -1 \quad \checkmark \quad (3)$$


$$\lim_{x \rightarrow \frac{1}{\sqrt{2}}} [1/x^2 - x] = [1/x^2 + 1/x] = [-1 + \frac{1}{\sqrt{2}}], [-\frac{1}{\sqrt{2}}] = -1 \quad \checkmark \quad (4)$$

حقیقتاً چون داخل برآست عدد جمع نمی شود؟ نه ای نمی کنیم.

$$\lim_{x \rightarrow \frac{1}{\sqrt{2}}} \frac{1/x - a + \left[\frac{1}{x^2} \right]}{1/x - \left[\frac{1}{x^2} \right]} \xrightarrow{\text{تکلیف برآست، راست می کنیم}} \begin{cases} x < \frac{1}{\sqrt{2}} \Rightarrow \frac{1}{x} > \sqrt{2} \Rightarrow \frac{1}{x^2} < 2 \Rightarrow \frac{1}{x^2} < 12 \\ \frac{1}{x^2} < 12 \Rightarrow \frac{1}{x} < \sqrt{12} \Rightarrow \frac{1}{x} < 2\sqrt{3} \end{cases} \quad [12] = 11$$

$\frac{1}{x^2} < 12 \Rightarrow \frac{1}{x} < \sqrt{12} \Rightarrow \frac{1}{x} < 2\sqrt{3}$

$$\lim_{x \rightarrow \frac{1}{\sqrt{2}}} \frac{1/x - a + 11}{1/x - \left[\frac{1}{x^2} \right]} = \frac{1/x + 4}{1/x - \left[\frac{1}{x^2} \right]} = \frac{-a + 4}{-1 + 1} = \frac{1}{0^-} \xrightarrow{\text{بسیار}} -\infty \quad \checkmark \quad (5)$$

$$\lim_{x \rightarrow 1^+} \frac{\sin^2 \pi x}{[x] + C \sin \pi x} \xrightarrow{\text{تکلیف برآست}} \frac{\sin^2 \pi x}{1 + C \sin \pi x} = \frac{1 - C \sin^2 \pi x}{1 + C \sin \pi x} = \frac{(1 - C \sin \pi x)(1 + C \sin \pi x)}{1 + C \sin \pi x} = 1 - C \sin \pi x \quad (6)$$

$$\lim_{x \rightarrow 1^+} 1 - C \sin \pi x = 1 - C \sin \pi = 1 - (-1) = 2 \quad \checkmark \quad (7)$$


$$\lim_{x \rightarrow -1} \frac{\sqrt{2x+3} - \sqrt{3x+1}}{1 + \sqrt{x}} \Rightarrow x \frac{\sqrt{2x+3}}{\sqrt{x}} \times \frac{\sqrt{x}}{\sqrt{x}} = \frac{\sqrt{2x+3}}{\sqrt{x}} = \frac{2x+3 - 3x-1}{x+1} = \frac{-x+2}{x+1} \quad (8)$$

$$\lim_{x \rightarrow -1} \frac{-(x+1)}{x+1} = -1 \quad \checkmark \quad (9)$$

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