

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره ۱۸... کلاس روز و ساعت

الف) $\lim_{n \rightarrow 2^+} \frac{2n+5}{n+1} \rightarrow \frac{9}{3} = 3$ ✓ ب) $\lim_{n \rightarrow 2^-} \frac{2n+5}{n+1} \rightarrow \frac{9}{3} = 3$ ✓

ج) $\lim_{n \rightarrow 2} \frac{2n+5}{n+1} \xrightarrow[\text{نادر}]{\text{نسبت سافری}} \frac{9}{3} = 3$ ✓ د) $\lim_{n \rightarrow 0} \frac{2n+7}{[n^2]}$ (۲)

بعد از سافری چوبه نون
نسبت تفاوتی ندارد $\frac{7}{[0^+]} \Rightarrow \frac{7}{0} \rightarrow \infty$ (تفریق) ✓

الف) $\lim_{n \rightarrow 2^-} \lfloor n \rfloor - 2 \xrightarrow{[n]=2} 2(2) - 2 = 2$ ✓ ب) $\lim_{n \rightarrow 2^-} \lfloor 2n - 2 \rfloor \rightarrow \lfloor 1 \rfloor = 1$ ✓

ج) $\lim_{n \rightarrow 2^-} \lfloor n - 2 \rfloor = 0$ ✓ د) $\lim_{n \rightarrow 2^+} \lfloor n - 2 \rfloor \rightarrow 0$ ✓ (۲)

الف) $\lim_{n \rightarrow 2^-} \frac{2[n]+1}{2} \xrightarrow{[n]=2} \frac{2(2)+1}{2} = \frac{5}{2}$ ✓ ب) $\lim_{n \rightarrow 2^-} \left\lfloor \frac{2n+1}{2} \right\rfloor \rightarrow \lfloor 2 \rfloor = 2$ ✓

ج) $\lim_{n \rightarrow 2^-} \left\lfloor \frac{2n+1}{2} \right\rfloor \rightarrow 2$ ✓ د) $\lim_{n \rightarrow 2^+} \left\lfloor \frac{2n+1}{2} \right\rfloor = 2$ ✓ (۲)

الف) $\lim_{n \rightarrow 1} \frac{n-5}{n^2-4n+5} \xrightarrow{n=1} \frac{-4}{5} \xrightarrow{n \rightarrow 1^+} \frac{-4}{0^+} = -\infty$ ✓
 $\xrightarrow{n \rightarrow 1^-} \frac{-4}{0^+} = -\infty$ ✓
حد ندارد
 $\rightarrow (n-1)(n-5) \rightarrow \frac{1 \cdot 5}{+1-1+}$ ✓

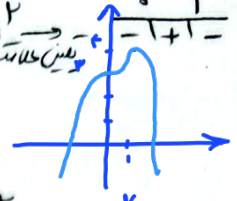
ب) $\lim_{n \rightarrow 3} \frac{n-4}{n^2-6n+9} \xrightarrow{n=3} \frac{-1}{0} \rightarrow \frac{-1}{0^+} = -\infty$ ✓
حد ندارد
 $\rightarrow (n-3)^2 \rightarrow \frac{-1}{0^+}$ ✓

الف) $\lim_{n \rightarrow -3} [-2n] - [5n] \xrightarrow{n \rightarrow -3^+} [6] - [-15] = 21$ ✓
 $\xrightarrow{n \rightarrow -3^-} [9] - [-14] = 23$ ✓
حد ندارد

ب) $\lim_{n \rightarrow (-\frac{1}{14})^-} \left\lfloor \frac{1}{n^2} \right\rfloor \rightarrow n < -\frac{1}{14} \rightarrow \left\lfloor -14^+ \right\rfloor = -15$ ✓
 $n^2 > \frac{1}{14} \rightarrow \frac{-1}{n^2} > -14$ ✓ (۲)

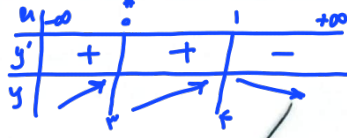
الف) $\lim_{n \rightarrow 1} [\varepsilon n^2 - \varepsilon n + r]$ $\xrightarrow{\text{مستقيم}}$ $-1\varepsilon n^2 + 1\varepsilon n^2 \rightarrow -1\varepsilon n(n-1)$

$\xrightarrow{\text{مستقيم}}$ $-1\varepsilon n(n-1)$



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1) $\rightarrow [\varepsilon^-] = r$



ب) $\lim_{n \rightarrow 0} [\varepsilon n^2 - \varepsilon n + r]$ $\xrightarrow{\text{مستقيم}}$ $-1\varepsilon n^2 + 1\varepsilon n^2 = -1\varepsilon n(n-1)$

$-1\varepsilon n^2 + 1\varepsilon n^2 = -1\varepsilon n(n-1)$

$\begin{cases} a = 0 \\ n = 1 \end{cases}$

$\rightarrow [r^+] = r$

$\lim_{x \rightarrow 0^+} [r^+] = r$
 $\lim_{x \rightarrow 0^-} [r^-] = r$

الف) $\lim_{n \rightarrow 2} \frac{n^2 - 1}{n^2 - \varepsilon}$ $\xrightarrow{\text{مستقيم}}$ $\frac{0}{0}$

$n \rightarrow 2^+ \rightarrow n > 2 \rightarrow n^2 > 4 \rightarrow n^2 - 1 > 0$

$\frac{n^2 - 1}{n^2 - \varepsilon} = \frac{(n-1)(n+1)}{(n-\varepsilon)(n+\varepsilon)}$

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$n \rightarrow 2^- \rightarrow n < 2 \rightarrow n^2 < 4 \rightarrow n^2 - 1 < 0$

$\frac{-(n^2 - 1)}{n^2 - \varepsilon} = \frac{-(n-1)(n+1)}{(n-\varepsilon)(n+\varepsilon)} = \frac{-(n+1)}{n+\varepsilon} \rightarrow \frac{-r^2(\varepsilon)}{\varepsilon} = -r^2$

ب) $\lim_{n \rightarrow \pi} \frac{|\sin n|}{\sin n}$ $\xrightarrow{\text{مستقيم}}$ $\frac{0}{0}$

$n \rightarrow \pi^+ \rightarrow \sin n < 0 \rightarrow \frac{-\sin n}{\sin n} = \frac{-1}{1} = -1$
 $n \rightarrow \pi^- \rightarrow \sin n > 0 \rightarrow \frac{\sin n}{\sin n} = \frac{1}{1} = 1$

الف) $\lim_{n \rightarrow \frac{\pi}{2}} \sqrt{\cos n} = \sqrt{0}$

$n \rightarrow \frac{\pi}{2}^+ \rightarrow \cos n > 0 \rightarrow \sqrt{0^+} = 0$
 $n \rightarrow \frac{\pi}{2}^- \rightarrow \cos n < 0 \rightarrow \sqrt{0^-} = 0$

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ب) $\lim_{n \rightarrow 0} \sqrt{n - \sqrt{n}} = \sqrt{0 - 0} = 0$

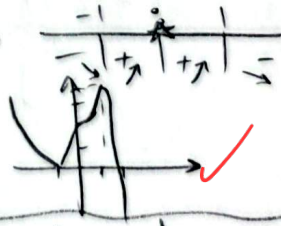
$\sqrt{n} \rightarrow n \geq 0 \rightarrow n - \sqrt{n} \geq 0 \rightarrow \sqrt{n}(\sqrt{n} - 1) \geq 0$

الف) $\lim_{n \rightarrow 0^+} \frac{(-1)^{\sin n}}{n^2 - n^2} \rightarrow n > 0 \rightarrow \sin n > 0 \rightarrow (-1)^0 = 1$
 $\xrightarrow{\text{مستقيم}}$ $\frac{1}{0} = +\infty$

ب) $\lim_{n \rightarrow 2} \frac{n^2 - [n^2]}{n - [n]}$ $\xrightarrow{n \rightarrow 2^+} \frac{n^2 - [2^+]}{n - [2^+]} = \frac{n^2 - \varepsilon}{n - \varepsilon} \xrightarrow{\text{مستقيم}}$ $\frac{(n-\varepsilon)(n+\varepsilon)}{(n-\varepsilon)} = n + \varepsilon$
 $\xrightarrow{n \rightarrow 2^-} \frac{n^2 - [2^-]}{n - [2^-]} = \frac{n^2 - 4}{n - 1} = \frac{n-2}{n-1} = 1$

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الف) $y = \omega n^2 - \varepsilon n^2 + r \xrightarrow{\text{مستقيم}}$ $-1\omega n^2 + 1\omega n^2 \rightarrow -1\omega n^2(n-1)(n+1)$
 $n = 1 \rightarrow y = -r + \omega + r = \omega$
 $n = 0 \rightarrow y = r$
 $n = -1 \rightarrow y = r - \omega + r = 2r - \omega$



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ب) $y = n^2 - r n^2 + r \xrightarrow{\text{مستقيم}}$ $\varepsilon n^2 - \varepsilon n \rightarrow \varepsilon n(n-1)(n+1)$

