

۱۹/۲۵ آذین

نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره ۱۱ ... کلاس: ...

الف) $\lim_{x \rightarrow 2^+} \frac{x+5}{x+1}$ $\Rightarrow \frac{2^++5}{2^++1}$ $\hookrightarrow \frac{q^+}{r^+} = \lim_{x \rightarrow 2^+} \frac{x+5}{x+1} = \frac{7}{3}$	ب) $\lim_{x \rightarrow 2^-} \frac{x+5}{x+1}$ $\frac{2^-+5}{2^-+1} = \frac{q^-}{r^-}$ $\Rightarrow \lim_{x \rightarrow 2^-} \frac{x+5}{x+1} = \frac{7}{3}$	ج) $\lim_{x \rightarrow 2} \frac{x+5}{x+1}$ $\frac{2+5}{2+1} = \frac{q}{r}$ $\Rightarrow \lim_{x \rightarrow 2} \frac{x+5}{x+1} = \frac{7}{3}$	د) $\lim_{x \rightarrow 0} \frac{x+1}{[x^2]}$ $\Rightarrow x=0^+ \Rightarrow \frac{1}{0^+}$ $x=0^- \Rightarrow \frac{1}{0^-}$ حد ندارد زیرا خروجی منهای
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$\lim_{n \rightarrow 2} f(n) = 2$ $\Rightarrow f \times 2 - 2 = 1 - 2 = -1$ $\Rightarrow \lim_{n \rightarrow 2} -1 = -1$	ب) $\lim_{n \rightarrow 2} [f(n) - 2]$ $\Rightarrow 1 - 2 = -1$ $\Rightarrow [1^-] = -1$ $\lim_{n \rightarrow 2} [1^-] = -1$	ج) $\lim_{n \rightarrow 3} [f(n) - 2]$ $n \rightarrow 3^-$ $1 - 2 = -1$ $\lim_{n \rightarrow 3^-} -1 = -1$ $[1^-] = -1$	د) $\lim_{n \rightarrow 3^+} [f(n) - 2]$ $n \rightarrow 3^+$ $1 - 2 = -1$ $\lim_{n \rightarrow 3^+} -1 = -1$ $[1^+] = -1$
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الف) $\lim_{n \rightarrow 3^-} \frac{3[n] + 1}{2}$ $\Rightarrow \frac{3 \times 2 + 1}{2} = \frac{7}{2}$	ب) $\lim_{n \rightarrow 3^-} \left[\frac{3n+1}{2} \right]$ $\Rightarrow \frac{q^-+1}{2} = \frac{1^-+1}{2} = \frac{2^-}{2}$ $\lim_{n \rightarrow 3^-} \left[\frac{3n+1}{2} \right] = 1^-$	ج) $\lim_{n \rightarrow 3^+} \left[\frac{3n+1}{2} \right]$ $\frac{q^++1}{2} = \frac{4^++1}{2} = \frac{5^+}{2}$ $\lim_{n \rightarrow 3^+} \left[\frac{3n+1}{2} \right] = 2^+$	د) $\lim_{n \rightarrow 3} \left[\frac{3n+1}{2} \right]$ $\frac{q+1}{2} = \frac{4+1}{2} = \frac{5}{2}$ $\lim_{n \rightarrow 3} \left[\frac{3n+1}{2} \right] = \frac{5}{2}$
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الف) $\lim_{n \rightarrow 1} \frac{n-2}{n^2-4n+4} = \frac{n-2}{(n-2)(n-2)}$ $n \rightarrow 1^+ \Rightarrow \frac{-1^+}{-1^+ \times 0^+} = +\infty$ $n \rightarrow 1^- \Rightarrow \frac{-1^-}{-1^- \times 0^-} = +\infty$	ب) $\lim_{n \rightarrow 3} \frac{n-2}{n^2-4n+4} = \frac{n-2}{(n-2)^2}$ $n=3^+ \Rightarrow \frac{1^+}{0^+} = +\infty$ $n=3^- \Rightarrow \frac{1^-}{0^-} = -\infty$
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الف) $\lim_{n \rightarrow -3} [-3n] - [5n] =$ $\Rightarrow n = -3^+ \Rightarrow [9^+] - [-15^+] = 9 - (-15) = 24$ $\lim_{n \rightarrow -3} [-3n] - [5n] = 9 - (-15) = 24$	ب) $\lim_{n \rightarrow (-\frac{1}{2})^-} \left[\frac{-1}{n^2} \right] =$ $\Rightarrow \left[\frac{-1}{(-\frac{1}{2})^2} \right] = \left[-4 \right] = -4$ $\lim_{n \rightarrow (-\frac{1}{2})^-} \left[\frac{-1}{n^2} \right] = -4$
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الف) $\lim_{n \rightarrow 1} [x n^3 - 2 n^2 + 3] \rightarrow \begin{cases} n=1^+ \rightarrow [x^+ - 2 + 3] = [1-2+3] = 2 \\ n=1^- \rightarrow [x^- - 2 + 3] = [1-2+3] = 2 \end{cases}$

$\Rightarrow \lim_{n \rightarrow 0} [x n^3 - 2 n^2 + 3] \rightarrow \begin{cases} n=0^+ \rightarrow [x^+ - 0] = [x^+] = 2 \\ n=0^- \rightarrow [x^- - 0] = [x^-] = 2 \end{cases}$

الف) $\lim_{n \rightarrow 2} \frac{|n^3 - 1|}{n^2 - 4}$

$\Rightarrow \lim_{n \rightarrow 2} \frac{|n^3 - 1|}{n^2 - 4} = \frac{|8 - 1|}{4 - 4} = \frac{7}{0}$

$\Rightarrow \lim_{n \rightarrow 2^+} \frac{|n^3 - 1|}{n^2 - 4} = \frac{7}{0^+} = +\infty$

$\Rightarrow \lim_{n \rightarrow 2^-} \frac{|n^3 - 1|}{n^2 - 4} = \frac{7}{0^-} = -\infty$

ب) $\lim_{n \rightarrow 0} \frac{|\sin n|}{n^2 - 4}$

$\Rightarrow \lim_{n \rightarrow 0} \frac{|\sin n|}{n^2 - 4} = \frac{0}{-4} = 0$

$\Rightarrow \lim_{n \rightarrow 0^+} \frac{|\sin n|}{n^2 - 4} = \frac{0}{-4} = 0$

$\Rightarrow \lim_{n \rightarrow 0^-} \frac{|\sin n|}{n^2 - 4} = \frac{0}{-4} = 0$

الف) $\lim_{n \rightarrow \frac{3\pi}{2}} \sqrt{\sin n}$

$\Rightarrow \lim_{n \rightarrow \frac{3\pi}{2}^+} \sqrt{\sin n} = \sqrt{0^+} = 0^+ > 0$

$\Rightarrow \lim_{n \rightarrow \frac{3\pi}{2}^-} \sqrt{\sin n} = \sqrt{0^-} = 0^- < 0$

ب) $\lim_{n \rightarrow 0} \sqrt{n - 2\sqrt{n}}$

$\Rightarrow \lim_{n \rightarrow 0^+} \sqrt{n - 2\sqrt{n}} = \sqrt{0 - 0} = 0$

$\Rightarrow \lim_{n \rightarrow 0^-} \sqrt{n - 2\sqrt{n}} = \sqrt{0 - 0} = 0$

ج) $\lim_{n \rightarrow 0} \sqrt{n - 2\sqrt{n}}$

$\Rightarrow \lim_{n \rightarrow 0^+} \sqrt{n - 2\sqrt{n}} = \sqrt{0 - 0} = 0$

$\Rightarrow \lim_{n \rightarrow 0^-} \sqrt{n - 2\sqrt{n}} = \sqrt{0 - 0} = 0$

الف) $\lim_{n \rightarrow 0^+} \frac{(-1)^{[\sin n]}}{n^2(n-1)}$

$\Rightarrow \lim_{n \rightarrow 0^+} \frac{(-1)^{[\sin n]}}{n^2(n-1)} = \frac{(-1)^{[0]}}{0^2(0-1)} = \frac{1}{0^-} = -\infty$

ب) $\lim_{n \rightarrow 2} \frac{n^2 - 4}{n - 2}$

$\Rightarrow \lim_{n \rightarrow 2^+} \frac{n^2 - 4}{n - 2} = \frac{0}{0^+} = +\infty$

$\Rightarrow \lim_{n \rightarrow 2^-} \frac{n^2 - 4}{n - 2} = \frac{0}{0^-} = -\infty$

الف) $y = \sin n - 2n^2 + 3$

$y' = \cos n - 4n \Rightarrow \cos n (1 - 4n^2)$

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