

تکلیف ۱

(A) (م) (A)

برای استیلا

$$1) \lim_{n \rightarrow \infty} \frac{P_n + \omega}{n+1} \rightarrow \frac{P(P) + \omega}{P+1} = \frac{9}{P} = P \quad \checkmark \quad -1$$

$$2) \lim_{n \rightarrow \infty} \frac{P_n + \omega}{n+1} \rightarrow \frac{P(P) + \omega}{P+1} = \frac{9}{P} = P \quad \checkmark$$

$$3) \lim_{n \rightarrow \infty} \frac{P_n + \omega}{n+1} \begin{cases} P^+ \rightarrow \frac{9}{P} = P \\ P^- \rightarrow \frac{9}{P} = P \end{cases} \quad \checkmark$$

(2)

$$4) \lim_{n \rightarrow \infty} \frac{P_n + V}{[n^2]} \begin{cases} o^+ \rightarrow \frac{V}{0} = \infty \\ o^- \rightarrow \frac{V}{0} = \infty \end{cases} \rightarrow \text{محدود} \quad \checkmark$$

$$5) \lim_{n \rightarrow \infty} [P_n] - P \rightarrow \epsilon \left[\frac{P^-}{P} \right] - P = \epsilon(P) - P = 4 \quad \checkmark \quad -2$$

$$6) \lim_{n \rightarrow \infty} [P_n - P] \rightarrow [P(P^-) - P] = [10^-] = 9 \quad \checkmark$$

$$7) \lim_{n \rightarrow \infty} [P_n - P] \rightarrow [10] = 10 \quad \checkmark$$

(2)

$$8) \lim_{n \rightarrow \infty} [P_n - P] \rightarrow [10] = 10 \quad \checkmark$$

● dotnote

$$\text{الف) } \lim_{x \rightarrow r^-} \frac{r[x]+1}{r} \rightarrow \frac{r[r^-]+1}{r} = \frac{r(r)+1}{r} = \frac{1}{r} \quad \checkmark$$

$$\text{ب) } \lim_{x \rightarrow r^-} \left[\frac{r[x]+1}{r} \right] \rightarrow \left[\frac{r(r^-)+1}{r} \right] = [\omega^-] = r \quad \checkmark$$

$$\text{ج) } \left[\lim_{x \rightarrow r^-} \frac{r[x]+1}{r} \right] \rightarrow [\omega] = \omega \quad \checkmark$$

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$$\text{د) } \left[\lim_{x \rightarrow r^+} \frac{r[x]+1}{r} \right] \rightarrow [\omega] = \omega \quad \checkmark$$

$$\text{الف) } \lim_{x \rightarrow 1} \frac{x - \omega}{x^2 - 4x + 4}$$

$\swarrow$ $\searrow$
 $x=1$ $x=\omega$

$$\frac{1}{+1} \quad \frac{\omega}{-1} \quad +$$

$$\begin{array}{l} 1^+ \rightarrow \frac{-\varepsilon}{0^-} = +\infty \\ 1^- \rightarrow \frac{-\varepsilon}{0^+} = -\infty \end{array} \quad \checkmark$$

فشار

$$\text{ب) } \lim_{x \rightarrow r} \frac{x \varepsilon}{x^2 - 4x + 4}$$

$\swarrow$ $\searrow$
 $x=r$ $x=\omega$

$$\frac{r}{+1} \quad \frac{\omega}{+1} \quad +$$

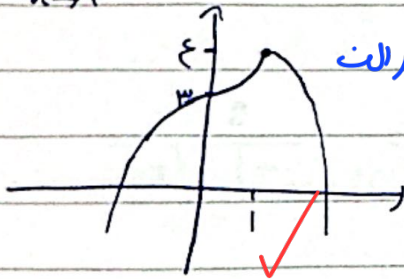
$$\begin{array}{l} r^+ \rightarrow \frac{-1}{0^+} = -\infty \\ r^- \rightarrow \frac{-1}{0^-} = -\infty \end{array} \quad \checkmark$$

فشار

الف) $\lim_{n \rightarrow -3} [-\frac{1}{n}] = [\omega n] \begin{cases} \nearrow \frac{1}{-3^+} = -\frac{1}{3} \\ \searrow \frac{1}{-3^-} = -\frac{1}{3} \end{cases}$ ✓ د

ب) $\lim_{n \rightarrow (-\frac{1}{14})^-} [\frac{-1}{n^2}] \rightarrow [\frac{-1}{\frac{1}{14}}] = [-14^+] = -14$ ✓ (2)

ج) $\lim_{n \rightarrow 1} [5n^3 - 3n^2 + 3] \xrightarrow{\text{Hof}} 1^3 - 1^2 + 3 = 1^3(1 - 1) = 0$ ✓ 4



د) $\lim_{n \rightarrow 1} [f^-] = 3$ ✓

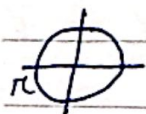
$\frac{+}{+} = +$

جواب

ب) $\lim_{n \rightarrow 0} [5n^3 - 3n^2 + 3] \begin{cases} \nearrow [3^+] = 3 \\ \searrow [3^-] = 3 \end{cases}$ ✓ (1/2)

ج) $\lim_{n \rightarrow 2} \frac{|n^3 - 1|}{n^2 - 1} \begin{cases} \nearrow \frac{2^3 - 1}{2^2 - 1} = \frac{7}{3} \\ \searrow \frac{-(2^3 - 1)}{2^2 - 1} = -\frac{7}{3} \end{cases}$ ✓ (2)

ب) $\lim_{n \rightarrow \pi} \frac{|\sin n|}{\sin 2n} \begin{cases} \nearrow \frac{-\sin \pi}{\sin 2\pi} = \frac{-0}{0} \\ \searrow \frac{+\sin \pi}{\sin 2\pi} = \frac{+0}{0} \end{cases}$ ✓ (2)



الف) $\lim_{n \rightarrow \frac{\pi}{2}} \sqrt{\cos n}$ $\begin{cases} \frac{\pi}{2}^+, \sqrt{0^+} = 0 \\ \frac{\pi}{2}^-, \sqrt{0^-} = 0 \end{cases}$ ✓ حد ندارد 45 -1

$x - \sqrt{x} \geq 0 \rightarrow \sqrt{x}(\sqrt{x} - 1) \geq 0 \rightarrow \frac{0}{+|-|+} \rightarrow x \geq 1 \leq x \leq 0$ (I) $x \geq 0$ (II)
پاسخ: $x = 0$ یا $x \geq 1$ $(I) \cap (II) \rightarrow x \geq 1$ یا $x = 0$ تعریف شده حد ندارد

ب) $\lim_{n \rightarrow 0} \sqrt{n - 2\sqrt{n}}$ $\begin{cases} 0^+, \sqrt{0 - 2\sqrt{0^+}} = \sqrt{0} = 0 \\ 0^-, \sqrt{0 - 2\sqrt{0^-}} = 0 \end{cases}$ $\lim_{n \rightarrow 0} \sqrt{n - 2\sqrt{n}} = 0$ تعریف شده حد ندارد

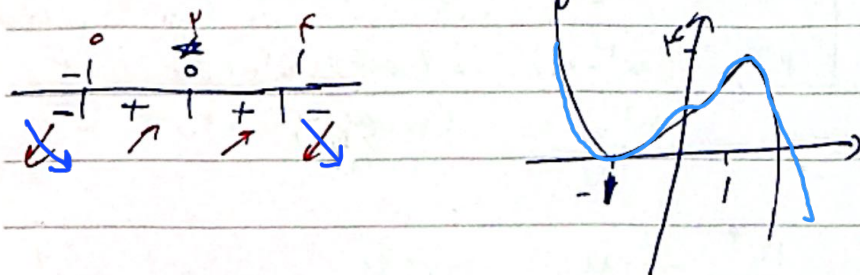
$n \geq 0$ و $n - 2\sqrt{n} \geq 0 \rightarrow n(\sqrt{n} - 2) \geq 0 \rightarrow \frac{0}{|-|-|+}$

الف) $\lim_{n \rightarrow 0^+} \frac{(-1)^{\lfloor \sin n \rfloor}}{n^3 - n^2} = \frac{(-1)^0}{0^-} = \frac{1}{0^-} = -\infty$ ✓ -9

$\{\sin 0^+\} = 0$, $n^3 - n^2 \geq 0 \rightarrow n^2(n - 1) = 0 \rightarrow \frac{0}{-|-|+}$ 2

ب) $\lim_{n \rightarrow 2} \frac{n^2 - \lfloor n^2 \rfloor}{n - \lfloor n \rfloor}$ $\begin{cases} 2^+, \frac{n^2 - \varepsilon}{n - 2} = \frac{(n-2)(n+2)}{n-2} = n+2 = 4 \\ 2^-, \frac{n^2 - 3}{n - 1} = 1 \end{cases}$ ✓ حد ندارد

الف) $y = \omega n^3 - \omega n^2 + 2 \rightarrow y' = 3\omega n^2 - 2\omega n \rightarrow \omega n^2(1 - \frac{2}{n}) = 0$ ✓



ب) $n^4 - 2n^2 + 3 \rightarrow y' = 4n^3 - 4n \rightarrow 4n^2(n^2 - 1) = 0$ ✓

