

$$\lim_{n \rightarrow 2} \frac{r(r)+8}{r+1} = \frac{9}{3} = 3 \quad \text{ا) } \checkmark$$

$$\lim_{n \rightarrow 2} \frac{r(r)+8}{r+1} = \frac{9}{3} = 3 \quad \text{ب) } \checkmark$$

$$\lim_{n \rightarrow 2} \frac{r(r)+8}{r+1} = \frac{9}{3} = 3 \quad \text{ج) } \checkmark$$

$$\lim_{n \rightarrow 0^+} \frac{r_n + 7}{[0, 3]} = \frac{r_n + 7}{0} \quad \text{د) } \checkmark$$

$$\lim_{n \rightarrow 0^+} \frac{r_n + 7}{[0, 3]} = \frac{r_n + 7}{0} \quad \text{ه) } \checkmark$$

$$\lim_{n \rightarrow 0^+} \frac{r_n + 7}{[0, 3]} = \frac{r_n + 7}{0} \quad \text{و) } \checkmark$$

$$\lim_{n \rightarrow 2^-} \varepsilon [r^-] - 2 = \varepsilon (2) - 2 = 0 \quad \text{ا) } \checkmark$$

$$\lim_{n \rightarrow 2^-} [\varepsilon (r^-) - 2] = [12 - 2] = 10 \quad \text{ب) } \checkmark$$

$$\lim_{n \rightarrow 2^-} [\varepsilon (r^-) - 2] = [12 - 2] = 10 \quad \text{ج) } \checkmark$$

$$\lim_{n \rightarrow 2^-} [n - 2] = [10] = 10 \quad \text{د) } \checkmark$$

$$\lim_{n \rightarrow 2^-} [n - 2] = [10] = 10 \quad \text{ه) } \checkmark$$

$$\lim_{n \rightarrow 2^-} [n - 2] = [10] = 10 \quad \text{و) } \checkmark$$

$$\lim_{n \rightarrow 2^-} \frac{r^2 [r^-] + 1}{r} = \frac{r(r) + 1}{r} = \frac{5}{2} \quad \text{ا) } \checkmark$$

$$\lim_{n \rightarrow 2^-} \left[\frac{r(r^-) + 1}{r} \right] = \left[\frac{5}{2} \right] = 2 \quad \text{ب) } \checkmark$$

$$\lim_{n \rightarrow 2^-} \left[\frac{r(r^-) + 1}{r} \right] = \left[\frac{5}{2} \right] = 2 \quad \text{ج) } \checkmark$$

$$\lim_{n \rightarrow 2^-} \frac{r_n + 1}{r} = [0] = 0 \quad \text{د) } \checkmark$$

$$\lim_{n \rightarrow 2^-} \frac{r_n + 1}{r} = [0] = 0 \quad \text{ه) } \checkmark$$

$$\lim_{n \rightarrow 2^-} \frac{r_n + 1}{r} = [0] = 0 \quad \text{و) } \checkmark$$

$$\frac{n-8}{(n-8)(n-1)} = \frac{1}{n-1} \rightarrow \lim_{n \rightarrow 1} \frac{1}{n-1} \quad \text{ا) } \checkmark$$

$$\frac{n-8}{(n-8)(n-1)} = \frac{1}{n-1} \rightarrow \lim_{n \rightarrow 1} \frac{1}{n-1} \quad \text{ب) } \checkmark$$

$$\frac{n-8}{(n-8)(n-1)} = \frac{1}{n-1} \rightarrow \lim_{n \rightarrow 1} \frac{1}{n-1} \quad \text{ج) } \checkmark$$

$$\lim_{n \rightarrow 1^+} \frac{1}{n-1} = +\infty \quad \text{د) } \checkmark$$

$$\lim_{n \rightarrow 1^+} \frac{1}{n-1} = +\infty \quad \text{ه) } \checkmark$$

$$\lim_{n \rightarrow 1^+} \frac{1}{n-1} = +\infty \quad \text{و) } \checkmark$$

$$\lim_{n \rightarrow -3} [-r_n] - [a_n] \rightarrow \lim_{n \rightarrow -3^+} [-r_n] - [a_n] = 1 - (-18) = 19 \quad \text{ا) } \checkmark$$

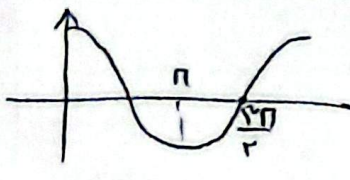
$$\lim_{n \rightarrow -3} [-r_n] - [a_n] \rightarrow \lim_{n \rightarrow -3^-} [-r_n] - [a_n] = 9 - (-14) = 23 \quad \text{ب) } \checkmark$$

$$\lim_{n \rightarrow -3} [-r_n] - [a_n] \rightarrow \lim_{n \rightarrow -3^-} [-r_n] - [a_n] = 9 - (-14) = 23 \quad \text{ج) } \checkmark$$

$$\lim_{n \rightarrow -3} [-r_n] - [a_n] \rightarrow \lim_{n \rightarrow -3^-} [-r_n] - [a_n] = 9 - (-14) = 23 \quad \text{د) } \checkmark$$

$$\lim_{n \rightarrow -3} [-r_n] - [a_n] \rightarrow \lim_{n \rightarrow -3^-} [-r_n] - [a_n] = 9 - (-14) = 23 \quad \text{ه) } \checkmark$$

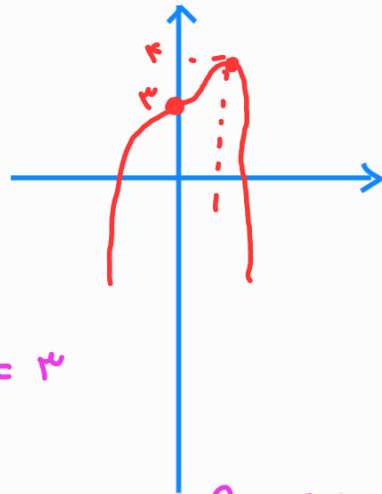
$$\lim_{n \rightarrow -3} [-r_n] - [a_n] \rightarrow \lim_{n \rightarrow -3^-} [-r_n] - [a_n] = 9 - (-14) = 23 \quad \text{و) } \checkmark$$

			٦
$\lim \begin{cases} x \rightarrow r^+ \Rightarrow \frac{x^2-1}{x^2-2} = \frac{x^2-2x+2}{x+2} = \frac{12}{2} = 6 \\ x \rightarrow r^- \Rightarrow \frac{-x^2+1}{x^2-2} = \frac{-x^2+2x-2}{x+2} = \frac{-12}{2} = -6 \end{cases}$	(ا.ب)		٧
$\lim \begin{cases} x \rightarrow \pi^+ \Rightarrow \frac{-\sin x}{\sin 2x} = \frac{1}{-2\cos x} = -\frac{1}{2} \\ x \rightarrow \pi^- \Rightarrow \frac{\sin x}{\sin 2x} = \frac{1}{2\cos x} = \frac{1}{2} \end{cases}$	(ب)		
 $\lim \begin{cases} x \rightarrow (\frac{\pi}{r})^+ \Rightarrow \sqrt{0^+} = 0 \\ x \rightarrow (\frac{\pi}{r})^- \Rightarrow \sqrt{0^-} = 0 \end{cases}$	(ا.ب)		٨
$x \rightarrow 0^+ \Rightarrow \sin x \rightarrow 0^+ \Rightarrow [\sin] = 0 \quad (-1)^{(0)} = 1 \Rightarrow \frac{1}{x^2 - x^2} = -\infty$	(ا.ب)		٩
$\lim \begin{cases} x \rightarrow r^+ \Rightarrow \frac{\varepsilon - [\varepsilon^+]}{r - [r^+]} = \frac{\varepsilon - \varepsilon}{r - r} = \frac{0}{0} \\ x \rightarrow r^- \Rightarrow \frac{\varepsilon - [\varepsilon^-]}{r - [r^-]} = \frac{\varepsilon - \varepsilon}{r - r} = \frac{0}{0} \end{cases}$	(ب)		١٠

$$y = [\epsilon n^3 - 3n^2 + 2] \rightarrow y' = 3\epsilon n^2 - 6n \rightarrow y' = 0 \rightarrow 3\epsilon n^2(1-n) = 0$$

$n=0, n=1$

		*		1
y'	-	-	-	+
y	↘	↘	↘	↗



الف) $\lim_{n \rightarrow 1} [\epsilon n^3 - 3n^2 + 2] = [\epsilon] = 3$

ب) $\lim_{n \rightarrow 0} [\epsilon n^3 - 3n^2 + 2] = \begin{cases} n > 0 \rightarrow \lim[y] = [\epsilon^+] = 3 \\ n < 0 \rightarrow \lim[y] = [\epsilon^-] = 2 \end{cases}$

$n - 2\sqrt{n} \geq 0 \rightarrow \sqrt{n}(\sqrt{n} - 2) \geq 0 \quad \forall n \leq 0$
 $\downarrow$
 $n \geq 0 \quad \text{I}$
 $\hookrightarrow n \geq 2 \quad \text{II}$

سوال ١ - ب

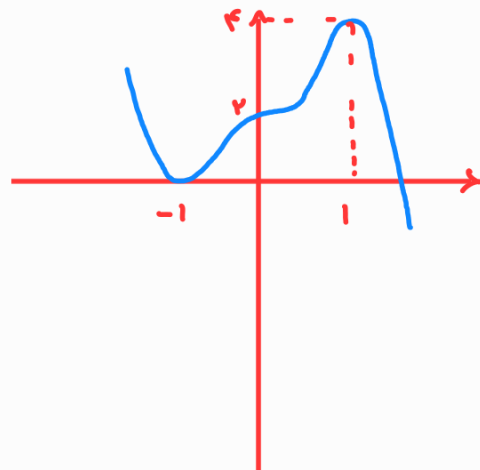
$\text{I} \cap \text{II} \quad n=0 \leq n \geq 2 \rightarrow \text{تبراهان ضروري نرسد} \quad \lim_{n \rightarrow 0} \sqrt{n - 2\sqrt{n}} = \infty$

$y = 5n^3 - 3n^2 + 2 \rightarrow y' = 15n^2 - 6n$

الف) ١٠

$y' = 0 \rightarrow 15n^2(1-n) = 0 \rightarrow n=0, n=1, n=-1$

n	-1	*	0	1
y'	-	+	+	-
y	↘	↗	↗	↘



$$y = x^3 - 2x^2 + 2 \rightarrow y' = 3x^2 - 4x$$

١٠ ج ١

$$y' = 0 \rightarrow 3x(x - \frac{4}{3}) = 0 \rightarrow x = 0, \frac{4}{3}, -\frac{4}{3}$$

x	-1	0	1
y'	$-$	$+$	$-$
y	$\searrow$	$\nearrow$	$\searrow$

