

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

د) $\lim_{n \rightarrow 0} \frac{2n+7}{[x^2]}$ $\begin{matrix} \nearrow 0^+ & \frac{0^+}{0^+} = 0^+ \\ \searrow 0^- & \frac{0^-}{0^+} = 0^- \end{matrix}$ ✓

الف) $\lim_{n \rightarrow 3^-} [x] + 2 = 1 + 2 = 3$ ب) $\lim_{n \rightarrow 3^-} [2n-2] = [4] = 4$

ج) $\lim_{n \rightarrow 3^-} [2n-2] = [4] = 4$ د) $\lim_{n \rightarrow 3^+} [2n-2] = [4] = 4$

الف) $\lim_{n \rightarrow 2^-} \frac{2[n]+1}{2} = \frac{2 \cdot 1 + 1}{2} = \frac{3}{2}$ ب) $\lim_{n \rightarrow 2^-} \left[\frac{2n+1}{2} \right] = [1.5] = 1$

ج) $\lim_{n \rightarrow 2^-} \left[\frac{2n+1}{2} \right] = [1.5] = 1$ د) $\lim_{n \rightarrow 2^+} \left[\frac{2n+1}{2} \right] = [1.5] = 1$

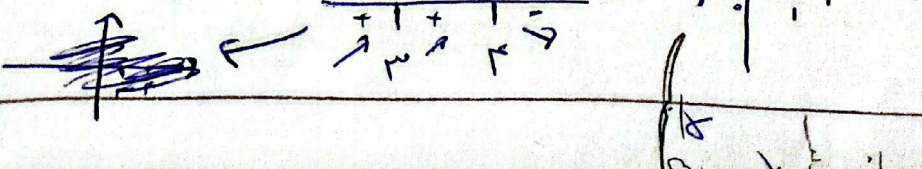
الف) $\lim_{n \rightarrow 1} \frac{n-5}{n^2-5n+5}$ $\begin{matrix} \nearrow 0^- & \frac{-4}{0^-} = +\infty \\ \searrow 0^+ & \frac{-4}{0^+} = -\infty \end{matrix}$ ب) $\lim_{n \rightarrow 1} \frac{n-5}{(n-1)^2}$ $\begin{matrix} \nearrow 0^+ & \frac{0^+}{0^+} = 0^+ \\ \searrow 0^- & \frac{0^-}{0^+} = 0^- \end{matrix}$

الف) $\lim_{n \rightarrow 2} [-2n] - [5n] = -4 - 10 = -14$

ب) $\lim_{n \rightarrow (-\frac{1}{2})^-} \left[\frac{-1}{n^2} \right] = [-1.6] = -1.6$

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

$y' = 12n^2 - 12n^2 = n^2(12 - 12n)$



$$\rightarrow \lim_{n \rightarrow \infty} [r_n - r_m] = [r^{\infty}] = r$$

$$\text{الف) } \lim_{n \rightarrow \infty} \frac{|x^n - 1|}{n^2 - r} = \frac{0}{0} \text{ type } \frac{(n-r)(n^2 + r + r_m)}{(n-r)(n+r)} \xrightarrow{r^+} \frac{n^2 + r + r_m}{n+r} = r$$

$$\xrightarrow{r^-} \frac{-n^2 - r - r_m}{n+r} = -r$$

$$\rightarrow \lim_{n \rightarrow \infty} \frac{|\sin n|}{\sin n} = \frac{0}{0} \text{ type } \frac{|\sin n|}{\sin n} \xrightarrow{h^+} \frac{1}{1} = 1$$

$$\xrightarrow{h^-} \frac{1}{-1} = -1$$

$$\text{الف) } \lim_{n \rightarrow \infty} \sqrt{\cos n} \xrightarrow{h^+} \sqrt{0^+} = 0$$

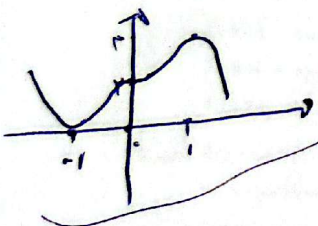
$$\xrightarrow{h^-} \sqrt{0^-} \text{ غير متناهية } \rightarrow \sqrt{0^+} = 0$$

$$\text{الف) } \lim_{n \rightarrow 0^+} \frac{(-1)^{\lfloor \sin n \rfloor}}{n^2 - n^2} = \frac{1}{n^2 - n^2} \xrightarrow{\text{جاذبة}} \frac{1}{\infty - \infty} = \frac{1}{-10000} \rightarrow \frac{1}{0^-} = -\infty$$

$$\rightarrow \lim_{n \rightarrow \infty} \frac{n^2 - [n^2]}{n - [n]} \xrightarrow{r^+} \frac{n^2 - r^2}{n - r} = \frac{(n+r)(n-r)}{(n-r)} = r$$

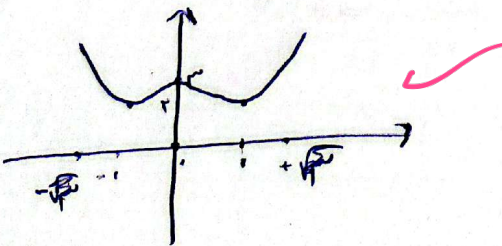
$$\xrightarrow{r^-} \frac{n^2 - r^2}{n - 1} = \frac{1}{1} = 1$$

$$\text{الف) } y = 5n^2 - 2n^3 + 2 \rightarrow y' = 10n - 6n^2 = n(10 - 6n^2) \rightarrow \frac{-1}{2} \frac{1}{3} \frac{1}{2}$$



$$y = n^2 - 2n^2 + 2 \rightarrow y' = 2n - 4n = 2n(n - 2)$$

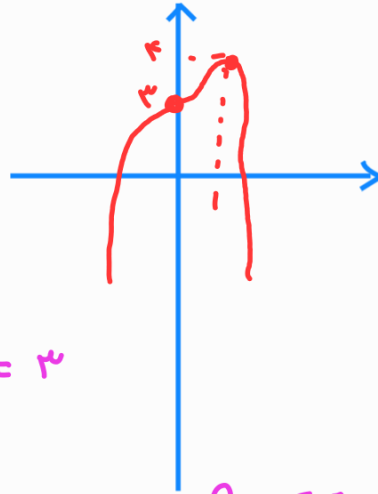
$$y = n^2 - 2n^2 + 2 \rightarrow y' = 2n - 4n = 2n(n - 2)$$



$$y = [4n^3 - 3n^2 + 3] \rightarrow y' = 12n^2 - 6n \rightarrow y' = 0 \rightarrow 12n^2(1-n) = 0 \quad -4$$

$n=0, n=1$

		*	
		0	1
y'	-	-	+
y	↘	↘	↗



الف) $\lim_{n \rightarrow 1} [4n^3 - 3n^2 + 3] = [4] = 4$

ب) $\lim_{n \rightarrow 0} [4n^3 - 3n^2 + 3] = \begin{cases} n > 0 \rightarrow \lim[y] = [4] = 4 \\ n < 0 \rightarrow \lim[y] = [3] = 3 \end{cases}$

$$n - 2\sqrt{n} \geq 0 \rightarrow \sqrt{n}(\sqrt{n} - 2) \geq 0 \quad \begin{matrix} \text{من } n \leq 0 \\ \rightarrow n \geq 2 \end{matrix} \quad \text{II}$$

$\downarrow$

$n \geq 0 \quad \text{I}$

سوال ۸ - ب

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