

19,5

سارا ساسانی یازدهم دختر A - تکلیف شماره ۲۹

$$\lim_{n \rightarrow r^+} f_{n-r} = a$$

(الف)

$$\lim_{n \rightarrow r^-} f_{n-r} = a$$

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ب-۱

$$\lim_{n \rightarrow r^+} f[n] - r = r - r = a$$

\swarrow
 $r \Rightarrow [n] = [r^+] = r$

(الف)

$$\lim_{n \rightarrow r^-} f[n] - r = r - r = 1$$

\swarrow
 $r \Rightarrow [n] = [r^-] = r-1$

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ب-۲

$$\lim_{n \rightarrow r^+} [f_{n-r}] = a \swarrow \Rightarrow [f_{n-r}] = [a^+] = a$$

(الف)

$$\lim_{n \rightarrow r^-} [f_{n-r}] \rightarrow a \swarrow \Rightarrow [f_{n-r}] = [a^-] = r$$

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ب-۳

$$\left[\lim_{n \rightarrow r^+} f_{n-r} \right] = [a] = a$$

(الف)

$$\left[\lim_{n \rightarrow r^-} f_{n-r} \right] = [a] = a$$

ب-۴

$$\lim_{n \rightarrow r^+} \frac{f_{n-r}}{n-r} = \frac{q}{0^+} \begin{matrix} \xrightarrow{n \rightarrow r^+} \frac{q}{0^+} = +\infty \\ \xrightarrow{n \rightarrow r^-} \frac{q}{0^-} = -\infty \end{matrix}$$

(الف)

$$\lim_{n \rightarrow r} \frac{f_{n-r}}{(n-r)^2} = \frac{q}{0^+} \begin{matrix} \xrightarrow{n \rightarrow r^+} \frac{q}{(0^+)^2} = \frac{q}{0^+} = +\infty \\ \xrightarrow{n \rightarrow r^-} \frac{q}{(0^-)^2} = \frac{q}{0^+} = +\infty \end{matrix}$$

ب-۵

$$\lim_{n \rightarrow r} \frac{f_{n-r}}{\sqrt{n-r}} = \frac{q}{0^+} \begin{matrix} \xrightarrow{n \rightarrow r^+} \frac{q}{\sqrt{0^+}} = \frac{q}{0^+} = +\infty \\ \xrightarrow{n \rightarrow r^-} \frac{q}{\sqrt{0^-}} = \frac{q}{0^+} = 0 \end{matrix}$$

(الف)

$$\lim_{n \rightarrow r} \frac{f_{n-r}}{\sqrt{n^2 - n + 1}} = \frac{q}{0^+} \begin{matrix} \xrightarrow{n \rightarrow r^+} \frac{q}{\sqrt{0^+}} = \frac{q}{0^+} = +\infty \\ \xrightarrow{n \rightarrow r^-} \frac{q}{\sqrt{0^-}} = \frac{q}{0^+} = -\infty \end{matrix}$$

ب-۶

$$\lim_{n \rightarrow r} \frac{f_{n-r}}{n^2 - n + 1} = \lim_{n \rightarrow r} \frac{f_{n-r}}{(n-r)(n-1)} = \frac{q}{0^+} \begin{matrix} \xrightarrow{n \rightarrow r^+} \frac{q}{0^+} = -\infty \\ \xrightarrow{n \rightarrow r^-} \frac{q}{0^+} = +\infty \end{matrix}$$

(الف)

$$\lim_{n \rightarrow r} \frac{f_{n-r}}{[n-r]} = \frac{q}{0^+} \begin{matrix} \xrightarrow{n \rightarrow r^+} \frac{q}{[0^+]} = \frac{q}{0^+} = 0 \\ \xrightarrow{n \rightarrow r^-} \frac{q}{[0^-]} = \frac{q}{-1} = -q \end{matrix}$$

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ب-۷

$$\lim_{n \rightarrow r} [f_n] + [-f_n] \xrightarrow{n \rightarrow r^+} = [q^+] + [(-q)^-] = q + (-q) = 0$$

$$\xrightarrow{n \rightarrow r^-} = [q^-] + [(-q)^+] = r + (-q) = 0$$

الف-۸

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ب

$$\lim_{n \rightarrow -q} [-f_n] + [f_n] \xrightarrow{n \rightarrow (-q)^+} = [r^+] + [(-r)^+] = r + (-r) = 0$$

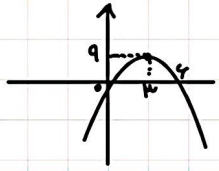
$$\xrightarrow{n \rightarrow (-q)^-} = [r^+] + [(-r)^-] = r + (-r) = 0$$

$$\lim_{n \rightarrow r} [a^r - f_n] \xrightarrow{\text{تابع درجه ۲}} \Rightarrow \lim_{n \rightarrow r} [a^r - f_n] = [(-r)^+] = -r$$

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الف-۹

$$\lim_{n \rightarrow r} [4n - n^2]$$



تابع درجه ۲ داریم $\Rightarrow \lim_{n \rightarrow r} [4n - n^2] = [4r - r^2] = 4$

(ب)

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

پس $\lim_{n \rightarrow r^+} \frac{n-r}{(n-r)(n-1)} = \lim_{n \rightarrow r^+} \frac{1}{n-1} = \frac{1}{r-1}$

$\lim_{n \rightarrow r^-} \frac{-(n-r)}{(n-r)(n-1)} = \lim_{n \rightarrow r^-} \frac{-1}{n-1} = \frac{-1}{r-1}$

(الف - ۱۰)

۱,۵ (ب)

$$\lim_{n \rightarrow 1} \frac{n - [n]}{n^2 - 1} = \frac{0}{0}$$

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

$\lim_{n \rightarrow 1^-} [n] = [1^-] = 0 \rightarrow \lim_{n \rightarrow 1^-} \frac{n}{n^2-1} = \frac{1}{0^-} = -\infty$