

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره ۱۸ ... کلاس روز و ساعت ...

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

ج) $\lim_{n \rightarrow 2} \frac{2n+5}{n+1} \xrightarrow[\text{نادر}]{\text{نسبت دو سافتر}} \frac{9}{3} = 3$ د) $\lim_{n \rightarrow 0} \frac{2n+7}{[n^2]}$

هـ) $\lim_{n \rightarrow 0} \frac{2n+7}{[n^2]} \xrightarrow[\text{نسبت دو سافتر چوبه بون}]{\text{نادر}} \frac{7}{[0^+]} \Rightarrow \frac{7}{0} \rightarrow \text{تفریق} \rightarrow \infty$

الف) $\lim_{n \rightarrow 2^-} \lfloor n \rfloor - 2 \xrightarrow{[n]=2} 2(2) - 2 = 2$ ب) $\lim_{n \rightarrow 2^-} \lfloor n-2 \rfloor \rightarrow [1^-] = 0$

ج) $\lim_{n \rightarrow 2^-} \lfloor n-2 \rfloor = 0$ د) $\lim_{n \rightarrow 2^+} \lfloor n-2 \rfloor \rightarrow 1$

الف) $\lim_{n \rightarrow 2^-} \frac{2[n]+1}{2} \xrightarrow{[n]=2} \frac{2(2)+1}{2} = \frac{5}{2}$ ب) $\lim_{n \rightarrow 2^-} \left\lfloor \frac{2n+1}{2} \right\rfloor \rightarrow \lfloor 2 \rfloor = 2$

ج) $\lim_{n \rightarrow 2^-} \left\lfloor \frac{2n+1}{2} \right\rfloor \rightarrow 2$ د) $\lim_{n \rightarrow 2^+} \left\lfloor \frac{2n+1}{2} \right\rfloor = 3$

الف) $\lim_{n \rightarrow 1} \frac{n-5}{n^2-4n+5} \xrightarrow{n=1} \frac{-4}{1-4+5} = \frac{-4}{2} = -2$ ب) $\lim_{n \rightarrow 1} \frac{n-5}{n^2-4n+5} \xrightarrow{n=1} \frac{-4}{1-4+5} = -2$

ج) $\lim_{n \rightarrow 1} \frac{n-5}{n^2-4n+5} \xrightarrow{n=1} \frac{-4}{1-4+5} = -2$ د) $\lim_{n \rightarrow 1} \frac{n-5}{n^2-4n+5} \xrightarrow{n=1} \frac{-4}{1-4+5} = -2$

الف) $\lim_{n \rightarrow -3} [-2n] - [5n] \xrightarrow{n \rightarrow -3^+} [6] - [-15] = 21$ ب) $\lim_{n \rightarrow -3} [-2n] - [5n] \xrightarrow{n \rightarrow -3^-} [6] - [-14] = 20$

ج) $\lim_{n \rightarrow (-\frac{1}{14})^-} \left\lfloor \frac{1}{n^2} \right\rfloor \rightarrow \frac{1}{n^2} > \frac{1}{14} \rightarrow \left\lfloor \frac{1}{n^2} \right\rfloor = 0$

$$\text{الف) } \lim_{n \rightarrow 1} [\varepsilon n^2 - 2n + 3] \xrightarrow{\text{مستقيم}} -12n^2 + 12n^2 \rightarrow \frac{0}{-1+1} = \frac{0}{0}$$

$$\rightarrow [\varepsilon^-] = 2$$

$$\text{ب) } \lim_{n \rightarrow 0} [\varepsilon n^2 - 2n + 3] \xrightarrow{\text{مستقيم}} -12n^2 + 12n^2 = -12n(n-1) \rightarrow \frac{0}{-1+1} \rightarrow [2^+] = 2$$

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$$\text{الف) } \lim_{n \rightarrow 2} \frac{n^2 - 1}{n^2 - 2} \xrightarrow{\text{مستقيم}} \frac{0}{0} \rightarrow \frac{n^2 - 1}{n^2 - 2} = \frac{(n-1)(n+1)}{(n-2)(n+2)}$$

$$\xrightarrow{n \rightarrow 2^-} \frac{n^2 - 1}{n^2 - 2} < 0 \quad \frac{-(n^2 - 1)}{n^2 - 2} = \frac{-(n-1)(n+1)}{(n-2)(n+2)} = \frac{-(n^2 + 2n + 2)}{n+2} \rightarrow \frac{-2^2(2)}{2} = -4$$

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$$\text{ب) } \lim_{n \rightarrow \pi} \frac{|\sin n|}{\sin n} \xrightarrow{\text{مستقيم}} \frac{0}{0} \rightarrow \frac{|\sin n|}{\sin n} \xrightarrow{n \rightarrow \pi^+} \frac{-\sin n}{\sin n} = \frac{-1}{1} = -1$$

$$\xrightarrow{n \rightarrow \pi^-} \frac{\sin n}{\sin n} = \frac{1}{1} = 1$$

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$$\text{الف) } \lim_{n \rightarrow \frac{\pi}{2}} \sqrt{\cos n} = \sqrt{0} \xrightarrow{n \rightarrow \frac{\pi}{2}^+} \cos n > 0 \rightarrow \sqrt{0^+} = 0$$

$$\xrightarrow{n \rightarrow \frac{\pi}{2}^-} \cos n < 0 \rightarrow \sqrt{0^-} = 0$$

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

$$\xrightarrow{n \rightarrow 0^+} \sqrt{n - 2\sqrt{n}} \rightarrow n - 2\sqrt{n} \geq 0 \rightarrow \sqrt{n}(\sqrt{n} - 2) \geq 0$$

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

$$\text{ب) } \lim_{n \rightarrow 2} \frac{n^2 - [n^2]}{n - [n]} \xrightarrow{n \rightarrow 2^+} \frac{n^2 - [2^+]}{n - [2^+]} = \frac{n^2 - 2}{n - 2} \xrightarrow{\text{مستقيم}} \frac{(n-2)(n+2)}{(n-2)} = n+2 = 4$$

$$\xrightarrow{n \rightarrow 2^-} \frac{n^2 - [2^-]}{n - [2^-]} = \frac{n^2 - 1}{n - 1} = \frac{n^2 - 1}{n - 1} = n+1 = 3$$

$$\text{الف) } y = \omega n^2 - 2n + 3 \xrightarrow{\text{مستقيم}} -12n^2 + 12n^2 \rightarrow \frac{-12n^2 + 12n^2}{-12n^2 + 12n^2} = \frac{0}{0}$$

$$n=1 \rightarrow y = -2 + 2 + 3 = 3$$

$$n=0 \rightarrow y = 3$$

$$n=-1 \rightarrow y = 3 - 2 + 3 = 4$$

$$\text{ب) } y = n^2 - 2n^2 + 3 \xrightarrow{\text{مستقيم}} \varepsilon n^2 - \varepsilon n \rightarrow \frac{\varepsilon n^2 - \varepsilon n}{\varepsilon n(n-1)(n+1)}$$

$$n=1 \rightarrow y = 3$$

$$n=0 \rightarrow y = 3$$

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