

$$۱) \lim_{n \rightarrow r^+} \frac{r(n) + d}{n+1} \rightarrow \frac{r(r^+) + d}{r^+ + 1} = \frac{q^+}{r^+} = \underline{r}$$

$$ب) \lim_{n \rightarrow r^-} \frac{r(n) + d}{n+1} \rightarrow \frac{r(r^-) + d}{r^- + 1} = \frac{q^-}{r^-} = \underline{r}$$

$$ج) \lim_{r \rightarrow r} \frac{r(n) + d}{n+1} \rightarrow \frac{r(r) + d}{r+1} = \frac{q}{r} = \underline{r}$$

$$د) \lim_{n \rightarrow 0} \frac{r(n) + v}{[n^2]} \rightarrow \frac{r(0) + v}{[0^+]} = \frac{v}{0} = \text{تقریباً } \leftarrow \text{نقطه}$$

$$۲) \lim_{n \rightarrow r^-} f(n) - 2 \rightarrow f(r^-) - 2 = 4$$

$$\rightarrow n < r \rightarrow [r^-] \in 2$$

$$ب) \lim_{n \rightarrow r^-} [f(n) - 2] \rightarrow [f(r^-) - 2] = [1.5] = 1$$

$$\rightarrow n < r$$

$$ج) \left[\lim_{n \rightarrow r^-} f(n) - 2 \right] \rightarrow f(r^-) - 2 = 1.5 \rightarrow [1.5] = 1$$

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

بازگشت حضرت امام خمینی (ره) به ایران و آغاز دهه مبارک فجر انقلاب اسلامی

$$۳) \lim_{n \rightarrow r^-} \frac{r^2(n) + 1}{r} \rightarrow \frac{r^2(r^-) + 1}{r} = \frac{r^2(r) + 1}{r} = \frac{v}{r} = \underline{r/d}$$

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

$$ج) \left[\lim_{n \rightarrow r^-} \frac{r^2(n) + 1}{r} \right] \rightarrow \frac{r^2(r^-) + 1}{r} = d^- \rightarrow d - [d] = \underline{d}$$

نقطه

1. $\lim_{n \rightarrow r^+} \left[\frac{n-r}{r} \right] \rightarrow \frac{r(r^+)H}{r} = d^+ \xrightarrow{\lim} d = [d] = \underline{d}$

9. (K) (ii) $\lim_{n \rightarrow 1} \frac{n-d}{n^2 - 9n + d} \rightarrow$

10. $n=1 \rightarrow 1 - 9 + d = 0^0 \rightarrow$ indeterminate

11. $\lim_{n \rightarrow 1^+} \frac{(n-d)}{(n-d)(n-1)} = \frac{1}{n-1} = \frac{1}{0^+} = +\infty$

12. $\lim_{n \rightarrow 1^-} \frac{(n-d)}{(n-d)(n-1)} = \frac{1}{n-1} = \frac{1}{0^-} = -\infty$

13. (L) $\lim_{n \rightarrow r} \frac{n-r}{n^2 - 9n + 9} \rightarrow$

14. $n=r \rightarrow 9 - 18 + 9 = 0^0 \rightarrow$ indeterminate

15. $\lim_{n \rightarrow r^+} \frac{n-r}{(n-r)^2} = \frac{n^+-r}{(n^+-r)^2} = \frac{-1^-}{0^+} = -\infty$

16. $\lim_{n \rightarrow r^-} \frac{n-r}{(n-r)^2} = \frac{n^--r}{(n^--r)^2} = \frac{-1^+}{0^+} = -\infty$

17. (d) (ii) $\lim_{n \rightarrow -r} [n] - [dn] \rightarrow$

18. $\lim_{n \rightarrow -r^+} [-r(-r^+)] - [d(-r^+)] = 4 + 16 = \underline{20}$

19. $\lim_{n \rightarrow -r^-} [-r(-r^-)] - [d(-r^-)] = 16 + 16 = \underline{32}$

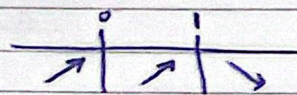
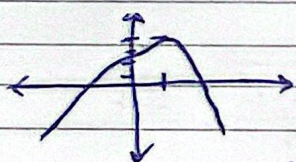
$$\lim_{n \rightarrow \infty} \left[\frac{-1}{n^2} \right] \rightarrow \left[\frac{-1}{\left(\left(-\frac{1}{p} \right)^n \right)^2} \right] = \left[\frac{-1}{\left(\frac{1}{16} \right)^2} \right] = [-16] = -16$$

مختصه هر ۱ نمره به شما می‌دهم
نکته!

$$4) \lim_{n \rightarrow \infty} [n^2 - n^2 + n] \rightarrow$$

صورت و مخرج به صفر می‌رسد:

$$\lim_{n \rightarrow \infty} [n^2 - n^2 + n] = 0 \rightarrow 12n^2 - 12n^2 \rightarrow 12n^2(-n+1)$$



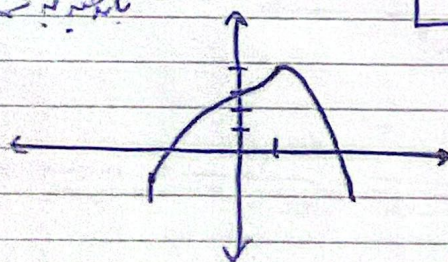
$$\begin{aligned} & \text{داده} \rightarrow 1^+ : n^- \rightarrow [n^-] = 12 \\ & \quad \quad \quad 1^- : n^- \end{aligned}$$

$$5) \lim_{n \rightarrow \infty} [n^2 - n^2 + n] \rightarrow$$

$$\{0 - 0 + n\} \rightarrow n^2$$

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

داده به صفر می‌رسد



$$\begin{aligned} & \rightarrow 0^+ : n^+ \rightarrow [n^+] = 12 \\ & \rightarrow 0^- : n^- \rightarrow [n^-] = 12 \end{aligned}$$

$$6) \lim_{n \rightarrow \infty} \frac{n^2 - 1}{n^2 - 1} \rightarrow$$

داده به صفر می‌رسد:

$$\lim_{n \rightarrow \infty} \frac{(n-1)(n+1)}{(n-1)(n+1)}$$

$$n^+ = \frac{n^2 - 1}{n+1} = \frac{n}{n+1} = \frac{1}{2}$$

$$n^- = \frac{-(n^2 - 1)}{n+1} = \frac{-n}{n+1} = -\frac{1}{2}$$

(الف) مرقعات منفرجه

$$8 \quad \lim_{n \rightarrow \infty} \frac{|\sin n|}{\sin 2n} \rightarrow$$

$$9 \quad \rightarrow r^+ : \frac{-\sin n}{r \sin n \cos n} = \frac{-1}{r \cos n} = \frac{-1}{-r} = \frac{1}{r}$$



$$10 \quad \rightarrow r^- : \frac{\sin n}{r \sin n \cos n} = \frac{1}{r \cos n} = \frac{1}{r}$$

$$12 \quad \lim_{n \rightarrow \frac{\pi}{2}} \sqrt{\cos n} \rightarrow \frac{0^+}{\frac{\pi}{2}} : \sqrt{\cos n} \rightarrow 0$$

$$13 \quad \rightarrow \frac{0^-}{\frac{\pi}{2}} : \sqrt{\cos n} \rightarrow 0$$

$$14 \quad \lim_{n \rightarrow 0} \sqrt{n - 2\sqrt{n}} \rightarrow 0^+ : \sqrt{0^+ - 2(0^+)} = \sqrt{0^+ - 0} = \sqrt{0} = 0$$

$$15 \quad \rightarrow 0^- : \sqrt{0^- - 2(0^-)} = \sqrt{0^- - 0} = \sqrt{0} = 0$$

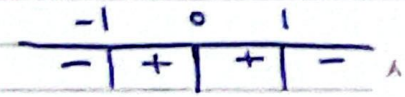
$$17 \quad \lim_{n \rightarrow 0^+} \frac{(-1)^{[n]}}{n^n - n^r} \rightarrow$$

$$18 \quad \rightarrow \frac{(-1)^{[0^+]}}{0^+ - 0^r} = \frac{-1}{0^+ - 0^r} = \frac{-1}{0^+ - 0^r} = \frac{-1}{0^+} = -\infty$$

$$19 \quad \lim_{n \rightarrow r} \frac{n^r - [n]}{n - [n]} \rightarrow r^+ : \frac{n^r - r}{n - r} = \frac{(n-r)(n+r)}{(n-r)} = \frac{n+r}{1} = \frac{r}{1}$$

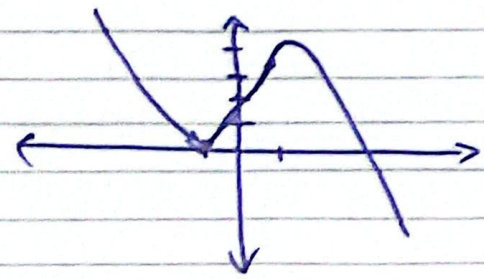
$$20 \quad \rightarrow r^- : \frac{n^r - n}{n - 1} = \frac{r - n}{r - 1} = \frac{1}{1} = 1$$

۱۰) $y = 10n^3 - 3n^2 + 2 \rightarrow$

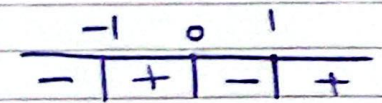


نتیجه: $10n^3 - 10n^2 = 10n^2(-n + 1)$
 $\begin{matrix} \nwarrow & \swarrow \\ 0 & \pm 1 \end{matrix}$

$-1 \rightarrow -0 + 3 + 2 = 0$
 $1 \rightarrow 0 - 3 + 2 = -1$
 $0 \rightarrow 2$



۱۱) $y = n^3 - 3n^2 + 3$



نتیجه: $3n^2 - 6n = 3n(n - 2)$
 $\begin{matrix} \nwarrow & \swarrow \\ 0 & \pm 2 \end{matrix}$

$1 \rightarrow 1 - 3 + 3 = 1$
 $0 \rightarrow 3$
 $-1 \rightarrow 1 - 3 + 3 = 1$

