

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

۱)  $\lim_{n \rightarrow 2} \frac{2n+5}{n+1} = \frac{4+5}{2} = \frac{9}{2}$   $\lim_{n \rightarrow 2} \frac{2n+5}{n+1} = \frac{9}{2}$   
 ۲)  $\lim_{n \rightarrow 2} \frac{2n+5}{n+1} = \frac{9}{2}$   $\lim_{n \rightarrow 2} \frac{2n+5}{n+1} = \frac{9}{2}$   
 ۳)  $\lim_{n \rightarrow 2} \frac{2n+5}{n+1} = \frac{9}{2}$   $\lim_{n \rightarrow 2} \frac{2n+5}{n+1} = \frac{9}{2}$

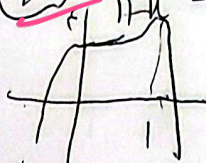
۱)  $\lim_{n \rightarrow 2} [f(n)-2] = 9$   $\lim_{n \rightarrow 2} [f(n)-2] = 9$   
 ۲)  $\lim_{n \rightarrow 2} [f(n)-2] = 9$   $\lim_{n \rightarrow 2} [f(n)-2] = 9$   
 ۳)  $\lim_{n \rightarrow 2} [f(n)-2] = 9$   $\lim_{n \rightarrow 2} [f(n)-2] = 9$

۱)  $\lim_{n \rightarrow 2} \frac{2n+5}{n+1} = \frac{9}{2}$   $\lim_{n \rightarrow 2} \frac{2n+5}{n+1} = \frac{9}{2}$   
 ۲)  $\lim_{n \rightarrow 2} \frac{2n+5}{n+1} = \frac{9}{2}$   $\lim_{n \rightarrow 2} \frac{2n+5}{n+1} = \frac{9}{2}$   
 ۳)  $\lim_{n \rightarrow 2} \frac{2n+5}{n+1} = \frac{9}{2}$   $\lim_{n \rightarrow 2} \frac{2n+5}{n+1} = \frac{9}{2}$

۱)  $\lim_{n \rightarrow 2} \frac{n-2}{n^2-n+2} = \frac{n-2}{(n-2)(n+1)} = \frac{1}{n+1}$   $\lim_{n \rightarrow 2} \frac{n-2}{n^2-n+2} = \frac{1}{n+1}$   
 ۲)  $\lim_{n \rightarrow 2} \frac{n-2}{n^2-n+2} = \frac{1}{n+1}$   $\lim_{n \rightarrow 2} \frac{n-2}{n^2-n+2} = \frac{1}{n+1}$   
 ۳)  $\lim_{n \rightarrow 2} \frac{n-2}{n^2-n+2} = \frac{1}{n+1}$   $\lim_{n \rightarrow 2} \frac{n-2}{n^2-n+2} = \frac{1}{n+1}$

۱)  $\lim_{n \rightarrow 2} [f(n)-2] = 9$   $\lim_{n \rightarrow 2} [f(n)-2] = 9$   
 ۲)  $\lim_{n \rightarrow 2} [f(n)-2] = 9$   $\lim_{n \rightarrow 2} [f(n)-2] = 9$   
 ۳)  $\lim_{n \rightarrow 2} [f(n)-2] = 9$   $\lim_{n \rightarrow 2} [f(n)-2] = 9$

جواب)  $\lim_{n \rightarrow \infty} [t_n^{\mu} - t_{n+1}^{\mu}] = \frac{\mu}{1-\mu} - \frac{\mu}{1-\mu} = \frac{\mu}{1-\mu} (1-\mu)$



$$\lim_{x \rightarrow 0} [x^m - x^n x^{m+n}] = 0^+ = 0$$

ii)  $\lim_{n \rightarrow r} \frac{|x^n - 1|}{n^r - 1}$   $\xrightarrow{r \neq 1} \frac{n^r - 1}{n^r - 1} = \frac{r}{r} = 1$

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

$\rightarrow \lim_{x \rightarrow 0} \frac{|\sin x|}{\sin x} \rightarrow \begin{cases} \frac{-\sin x}{\sin x} = -\frac{1}{1} = -1 & \text{for } x < 0 \\ \frac{\sin x}{\sin x} = \frac{1}{1} = 1 & \text{for } x > 0 \end{cases}$

$\lim_{x \rightarrow \frac{\pi}{2}} \sqrt{\cosh x}$   
 $x \rightarrow \frac{\pi}{2}$

۱)  $\lim_{n \rightarrow \infty} \sqrt{n - 2\sqrt{n}} \rightarrow \infty = \infty$

$$\text{الف) } \lim_{n \rightarrow \infty} \frac{(-1)^{\lfloor \sin n \rfloor}}{n^{m-1}} = \frac{1}{n^{m-1}} = \frac{1}{0} = -\infty$$

$$\lim_{n \rightarrow r} \frac{n^r - [n^r]}{n - [n]} = \frac{n^r - r}{n - r} = n + r \Rightarrow \boxed{r}$$

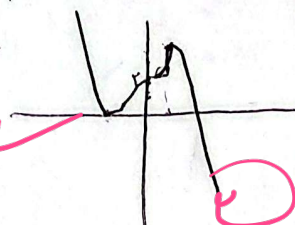
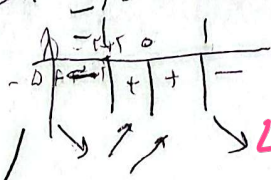
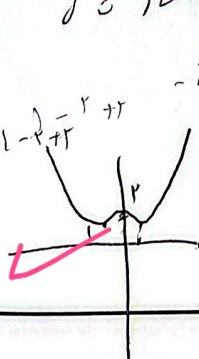
$$\lim_{n \rightarrow r} \frac{n^r - r^0}{n - 1} = \frac{1}{1} = \boxed{1}$$

$y = \Delta n^r - r n^D + r$   
 $y = n^L - r n^r + r$   
 $y' = f n^r - f n = f n (n^r - 1)$

Sign chart for  $y'$ :
 

|      |     |     |          |
|------|-----|-----|----------|
| $n$  | $0$ | $1$ | $\infty$ |
| $y'$ | $-$ | $0$ | $+$      |

Graphs of  $y$  and  $y'$  are shown, with a pink line indicating the sign of  $y'$  and a pink arrow indicating the direction of the curve.



سوال ۵-الف

$$\lim_{n \rightarrow -3} [-3n] - [5n] \rightarrow \lim_{n \rightarrow -3^+} [-3n] - [5n] = 1 - (-15) = 16$$

$$\hookrightarrow \lim_{n \rightarrow -3^-} [-3n] - [5n] = 9 - (-15) = 24$$

$$n - 2\sqrt{n} \geq 0 \rightarrow \sqrt{n}(\sqrt{n} - 2) \geq 0 \quad \text{II}$$

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

$\sqrt{n} \leq 2$   
 $\hookrightarrow n \leq 4$

سوال ۸-ب

$$I \cap II \quad n=0 \leq n \leq 4 \rightarrow \text{تقاطع شرطی نه شد} \quad \lim_{n \rightarrow 0} \sqrt{n - 2\sqrt{n}} = \times$$