

مریم توکلی
دانشگاه A
تکلیف 1A

(سوال 1)

الف) $\lim_{n \rightarrow 2^+} \frac{2n+5}{n+1}$

$$n = 2^+ \rightarrow y = \frac{2(2)+5}{2+1} = \frac{9}{3} = \boxed{3}$$

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

$$n = 2^- \rightarrow y = \frac{2(2)+5}{2+1} = \frac{9}{3} = \boxed{3}$$

ج) $\lim_{n \rightarrow 2} \frac{2n+5}{n+1}$

$$n = 2 \rightarrow y = \frac{2(2)+5}{2+1} = \frac{9}{3} = \boxed{3}$$

د) $\lim_{n \rightarrow 0} \frac{2n+5}{[n^2]}$

* در اینجا به 0 میل داریم، کلاً بی‌معنی، صفر شده
و حاصل، تعریف نشده می‌شود

$$\rightarrow \boxed{\frac{5}{0} = \infty}$$

الف) $\lim_{n \rightarrow -3} [-2n] - [5n]$

(سوال 2)

$$n = -3^+ \rightarrow y = [9^-] - [15^+] = 8 - 15 = \boxed{-7}$$

$$n = -3^- \rightarrow y = [9^+] - [-15^-] = 9 + 14 = \boxed{23}$$

ب) $\lim_{n \rightarrow (-\frac{1}{2})^-} \left[-\frac{1}{n^4}\right]$

$$n < -\frac{1}{2} \rightarrow \frac{1}{n} > -2 \rightarrow \frac{1}{n^4} < 16$$

$$\rightarrow -\frac{1}{n^4} > -16 \sim -\frac{1}{n^4} = -14^+ \rightarrow [-14^+] = \boxed{-14}$$

پ.ن: بی‌نهایت من سوالات رو به ترتیب بنویستم. واقعاً شرمند.

$$\text{الف) } \lim_{n \rightarrow 2^-} f[n] - 2 \rightarrow (4 \times 2) - 2 = \boxed{6}$$

(سوال ۲)

$$\text{ب) } \lim_{n \rightarrow 2^-} [f[n] - 2] \rightarrow [f(2^-) - 2] = [2 - 2] = \boxed{0}$$

$$\text{ج) } \lim_{n \rightarrow 2^-} f[n] - 2 \rightarrow y = f(2) - 2 = \boxed{10}$$

$$\text{د) } \lim_{n \rightarrow 2^+} [f[n] - 2] \rightarrow y = f(2) - 2 = \boxed{10}$$

$$\text{الف) } \lim_{n \rightarrow 2^-} \frac{3[n] + 1}{2} \rightarrow [3] = 2 \rightarrow \frac{9 + 1}{2} = \boxed{\frac{10}{2}}$$

(سوال ۳)

$$\text{ب) } \lim_{n \rightarrow 2^-} \left[\frac{3n + 1}{2} \right] \rightarrow \left[\frac{(3 \times 2^-) + 1}{2} \right] = \left[\frac{10}{2} \right] = \boxed{5}$$

$$\text{ج) } \lim_{n \rightarrow 2} \frac{3n + 1}{2} \rightarrow \frac{3(2) + 1}{2} = \frac{7}{2} = \boxed{3.5}$$

* برای در کل، تغییری در جواب ندارد

$$\text{د) } \lim_{n \rightarrow 2^+} \frac{3n + 1}{2} \rightarrow \frac{3(2) + 1}{2} = \frac{7}{2} = \boxed{3.5}$$

Subject: _____

Year: _____

Month: _____

Date: _____

c) $\lim_{n \rightarrow 1} \frac{n-1}{n^2-4n+4} \rightsquigarrow \frac{n-1}{(\cancel{n-1})(n-1)} = \frac{1}{n-1}$ (سوال 5)

$n=1$ $\begin{cases} 1^+ & \frac{1}{0^+} = +\infty \\ 1^- & \frac{1}{0^-} = -\infty \end{cases} \rightsquigarrow \boxed{\text{2 line}}$

b) $\lim_{n \rightarrow 2} \frac{n-2}{n^2-4n+4} \rightsquigarrow \frac{n-2}{(n-2)^2}$

$n=2$ $\begin{cases} 2^+ & \frac{-1}{(0^+)^2} = \frac{-1}{0^+} = -\infty \\ 2^- & \frac{-1}{(0^-)^2} = \frac{-1}{0^+} = -\infty \end{cases} \boxed{\text{2 line}}$

حل) $\lim_{n \rightarrow 1} [En^3 - 3n^2 + 3]$

(سوال ٩)

حساب $\rightarrow -12n^2 + 6n \rightarrow -12n(n-1)$

$$\begin{array}{c} 0 \quad 1 \\ + \quad | \quad + \quad | \quad - \\ \nearrow \quad \nearrow \quad \searrow \end{array}$$

$n=1 \rightarrow E(1) - 3(1) + 3 = 3$

$\rightarrow [3^-] = \boxed{3}$

ب) $\lim_{n \rightarrow 0} [En^3 - 3n^2 + 3]$

حساب $\rightarrow -12n^2 + 6n \rightarrow -12n^2(n-1)$

$$\begin{array}{c} 0 \quad 1 \\ + \quad | \quad + \quad | \quad = \\ \nearrow \quad \nearrow \quad \searrow \end{array}$$

$n=0 \rightarrow E(0) - 3(0) + 3 = 3$

$[3^+] = \boxed{3}$

حل) $\lim_{n \rightarrow 2} \frac{|n^3 - 1|}{n^2 - 4}$

(سوال ٧)

$n=2 \quad \begin{array}{l} r+ \\ r- \end{array} \quad \begin{array}{l} + (n-1)(n^2 + 4n + 4) \\ - (n-1)(n^2 + 4n + 4) \end{array} \rightarrow \frac{12}{4} = \boxed{+3}$

$\begin{array}{l} r+ \\ r- \end{array} \quad \begin{array}{l} + (n-1)(n^2 + 4n + 4) \\ - (n-1)(n^2 + 4n + 4) \end{array} = \frac{-12}{4} = \boxed{-3}$

در حد ٣

ب) $\lim_{n \rightarrow \pi} \frac{|\sin n|}{\sin n}$

$n = \pi \quad \begin{array}{l} \pi+ \\ \pi- \end{array} \quad \begin{array}{l} = \frac{-\sin n}{\pi \sin n \cos n} = \frac{-1}{\pi \cos n} \\ + \frac{\sin n}{\pi \sin n \cos n} = \frac{+1}{\pi \cos n} \end{array}$

در حد ١

آپادانا

(0^-) 0^+

الف) $\lim_{n \rightarrow \frac{\pi}{2}} \sqrt{\cos n}$

(سوال 1)

$n = \frac{\pi}{2} + \frac{\pi}{r}$ $y = \sqrt{0^+} = 0^+$
 $n = \frac{\pi}{2} - \frac{\pi}{r}$ $y = \sqrt{0^-} = 00$

النه

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

$n = 0^+$ $\sqrt{0^+ - 2\sqrt{0^+}} = 00$
 $n = 0^-$ $\sqrt{0^- - 2\sqrt{0^-}} = 00$

$$\text{الف) } \lim_{n \rightarrow 0^+} \frac{(-1)^{[\sin n]} [\sin n]}{n^2 - n^2} \quad [\sin 0^+] = 0$$

(سوال 9)

$$\rightarrow \frac{(-1)^0}{-n^2} = \frac{1}{-n^2} = \frac{1}{0^-} = -\infty \rightarrow \boxed{\text{نا محدود}}$$

$$\text{ب) } \lim_{n \rightarrow 2} \frac{n^2 - [n^2]}{n - [n]}$$

$$n=2 \begin{cases} \xrightarrow{r+} \frac{n^2 - \epsilon}{n - r} \rightarrow \frac{(n-r)(n+r)}{n-r} = n+r \rightarrow r+r = \epsilon \\ \xrightarrow{r-} \frac{n^2 - r}{n - 1} \rightarrow \frac{\epsilon - r}{r-1} = \frac{1}{r-1} \end{cases} \rightarrow \boxed{\text{نا محدود}}$$

$$\text{ج) } y = 2n^3 - 3n^2 + 2$$

(سوال 10)

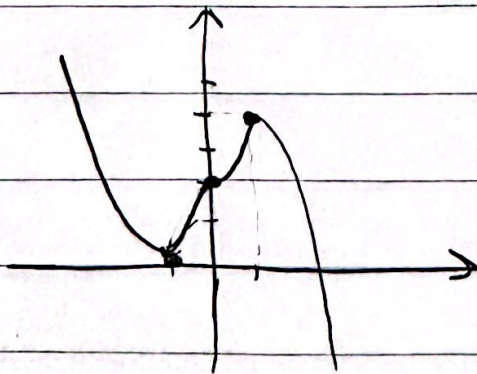
$$\text{حقیقت} \rightarrow y' = -12n^2 + 12n^1 \rightarrow -12n^1 (n-1)(n+1)$$

$$\begin{array}{c} -1 \quad 0 \quad +1 \\ - \quad | \quad + \quad | \quad + \quad | \quad - \\ \swarrow \quad \nearrow \quad \nearrow \quad \searrow \end{array}$$

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

$$n=0 \rightarrow y = 2$$

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



Subject:

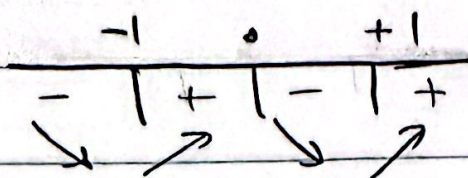
Year:

Month:

Date:

$$b) y = x^3 - 3x^2 + 2x$$

$$\text{Derivative} \rightarrow y' = 3x^2 - 6x \rightarrow 3x(x-1)(x+1)$$



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

$$x=0 \rightarrow y = 0$$

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

