

سارا کبابچی
۱- حاصل مردها؟

$$\text{الف) } \lim_{x \rightarrow 2^+} \frac{2x+5}{x+1} = \frac{9}{3} = 3$$

$$\text{ج) } \lim_{x \rightarrow 2} \frac{2x+5}{x+1} = \frac{9}{3} = 3$$

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

$$\text{د) } \lim_{x \rightarrow 0} \frac{2x+5}{[x^2]_{0^+}} = \frac{5}{0} \rightarrow \infty$$

$$\text{الف) } \lim_{x \rightarrow 3^-} f[x] - 2 = f(3^-) - 2 = 9$$

$$\text{ج) } \left[\lim_{x \rightarrow 3^-} f[x] - 2 \right] = 10$$

$$\text{ب) } \lim_{x \rightarrow 3^-} [f[x] - 2] = 4$$

$$\text{د) } \left[\lim_{x \rightarrow 3^+} f[x] - 2 \right] = 10$$

$$\text{الف) } \lim_{x \rightarrow 3^-} \frac{3[x]+1}{2} = \frac{3(3)+1}{2} = \frac{10}{2} = 5$$

$$\text{ج) } \left[\lim_{x \rightarrow 3^-} \frac{3[x]+1}{2} \right] = 5$$

$$\text{ب) } \lim_{x \rightarrow 3^-} \left[\frac{3[x]+1}{2} \right] = 4$$

$$\text{د) } \left[\lim_{x \rightarrow 3^+} \frac{3[x]+1}{2} \right] = 5$$

$$\text{الف) } \lim_{n \rightarrow 1} \frac{n-5}{n^2-4n+4} \begin{cases} 1^+ \rightarrow \frac{-4}{0^+} = +\infty \\ 1^- \rightarrow \frac{-4}{0^+} = -\infty \end{cases}$$

$$\text{ب) } \lim_{n \rightarrow 2} \frac{n-4}{n^2-4n+4} \begin{cases} 2^+ \rightarrow \frac{-1}{0^+} = -\infty \\ 2^- \rightarrow \frac{-1}{0^+} = -\infty \end{cases}$$

$$\text{الف) } \lim_{x \rightarrow -3} [f(x)] - [5x] \begin{cases} -3^+ \rightarrow -1 - (-15) = 14 \\ -3^- \rightarrow -1 - (-14) = 13 \end{cases}$$

$$\text{ب) } \lim_{x \rightarrow (-\frac{1}{2})^-} \left[\frac{-1}{x^2} \right] = [-4^+] = -14$$

$$n < -\frac{1}{x} \rightarrow \frac{1}{n} > -2 \rightarrow \frac{1}{nf} < 12 \rightarrow \frac{-1}{nf} > -12$$

$$\text{الف) } \lim_{n \rightarrow 1} [f_n^3 - 3n^2 + 2] = [f^3] = [2] = 3$$

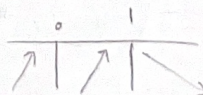
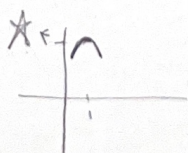
$$\text{ب) } \lim_{n \rightarrow 0} [f_n^3 - 3n^2 + 2] \begin{cases} 0^+ \rightarrow [2^3] = 8 \\ 0^- \rightarrow [2] = 2 \end{cases}$$

$$y' = 12n^2 - 12n^3 = 0$$

$$y'' = 24n - 36n^2 \xrightarrow{n=1} 24 - 36 < 0$$

$$y' = 12n^2 - 12n^3 = 0$$

$$12n^2(1-n) = 0 \quad \begin{cases} n=0 \\ n=1 \end{cases}$$



الف) $\lim_{x \rightarrow 2} \frac{|x^2 - 4|}{x^2 - 4}$

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

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



$\xrightarrow{\pi^+} \frac{-\sin n}{\sin n \cos n} = \frac{-1}{1(-1)} = \frac{1}{1}$
 $\xrightarrow{\pi^-} \frac{\sin n}{\sin n \cos n} = \frac{1}{1(-1)} = -\frac{1}{1}$

حد ندارد

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

$x \rightarrow \frac{\pi}{2}$



$\left(\frac{\pi}{2}\right)^+ \rightarrow \sqrt{\cos\left(\frac{\pi}{2}\right)} = 0$

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$\left(\frac{\pi}{2}\right)^- \rightarrow \sqrt{\cos\left(\frac{\pi}{2}\right)} \Rightarrow$ تکریف نشده

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

$x \rightarrow 0$

$\xrightarrow{0^+} \sqrt{x - 0} = 0$

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$\xrightarrow{0^-} \sqrt{x - 2\sqrt{x}} \Rightarrow$

تکریف نشده

الف) $\lim_{x \rightarrow 0^+} \frac{(-1)^{[\sin x]}}{x^2 - x^2}$

$\frac{(-1)^0}{0^0} = \frac{1}{0^0} = -\infty$

$\frac{1^{x^2} - 1^{x^2}}{x^2 - x^2} \rightarrow 0^0$



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

$\xrightarrow{x^+} \frac{x^2 - 4}{x - 2} = \frac{(x-2)(x+2)}{(x-2)} = 4$
 $\xrightarrow{x^-} \frac{x^2 - 3}{x - 1} = \frac{4 - 3}{2 - 1} = 1$

حد ندارد

۱۰. نمودارهای زیر را به مشتق آنگاه بنویس.

الف) $y = 5x^3 - 3x^5 + 2$

$y' = 15x^2 - 15x^4 \rightarrow 15x^2(1 - x^2)$

$x = -1 \Rightarrow y = -5 + 3 + 2 = 0$

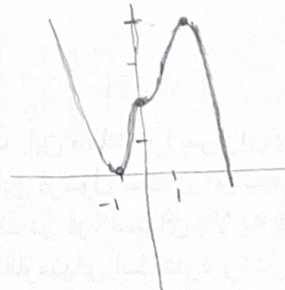
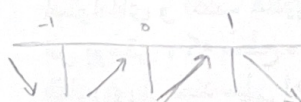
$x = 0 \Rightarrow y = 2$

$x = 1 \Rightarrow y = 5 - 3 + 2 = 4$

$x = 0 \rightarrow$ مینیمم

$x = 1$

$x = -1$



ب) $y = x^4 - 2x^2 + 3$

$y' = 4x^3 - 4x \rightarrow 4x(x^2 - 1)$

$x = 0$

$x = 1$

$x = -1$

$x = 0 \Rightarrow y = 3$

$x = 1 \Rightarrow y = 1 - 2 + 3 = 2$

$x = -1 \Rightarrow y = 1 - 2 + 3 = 2$

$x = -2 \Rightarrow y = 16 - 8 + 3 = 11$

