

موسا خانی / تکلیف شماره ۱۸

الف) $\lim_{x \rightarrow 2^+} \frac{4x + 3}{x + 1} \xrightarrow{x=2} \frac{9}{3} = 3$

(۱)

ب) $\lim_{x \rightarrow 2^-} \frac{4x + 3}{x + 1} \xrightarrow{x=2} \frac{9}{3} = 3$

ج) $\lim_{x \rightarrow 2} \frac{4x + 3}{x + 1} \xrightarrow{x=2} \frac{9}{3} = 3$

د) $\lim_{x \rightarrow 0} \frac{4x + V}{[e^x]}$

$\xrightarrow{x \rightarrow 0^+} \frac{V}{0}$ تعریف نشده
 $\xrightarrow{x \rightarrow 0^-} \frac{V}{0}$ تعریف نشده

→ مقدار

(۲)

$$\text{الف) } \lim_{x \rightarrow 2^-} f(x) = 2 \quad x=2, \lim_{x \rightarrow 2} 1-x = 9$$

$$\text{ب) } \lim_{x \rightarrow 2^-} [f(x)-2] \xrightarrow{x=2, \lim_{x \rightarrow 2} [1, 2-x] = 9} \lim_{x \rightarrow 2^-} [1, 2-x] = 9$$

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

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

$$\text{الف) } \lim_{x \rightarrow 2^-} \frac{f(x)+1}{x} \xrightarrow{x=2, \lim_{x \rightarrow 2} \frac{V}{x} = \frac{V}{x}} \lim_{x \rightarrow 2^-} \frac{V}{x} = \frac{V}{x}$$

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

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

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

الف) $\lim_{x \rightarrow 1} \frac{x - \omega}{x^2 - 6x + \omega} \xrightarrow{x=1} \frac{-f}{0}$

$\lim_{x \rightarrow 1} \frac{x - \omega}{(x-1)(x-\omega)} = \lim_{x \rightarrow 1} \frac{1}{x-1}$

$\begin{cases} 1^+ \rightarrow \frac{1}{0^+} = +\infty \\ 1^- \rightarrow \frac{1}{0^-} = -\infty \end{cases}$

→ در ندارد

ب) $\lim_{x \rightarrow 3} \frac{x - f}{x^2 - 6x + 9} \xrightarrow{x=3} \frac{-1}{0}$

$\lim_{x \rightarrow 3} \frac{x - f}{(x-3)^2} \begin{cases} x \rightarrow 3^+ \rightarrow \frac{-1}{0^+} = -\infty \\ x \rightarrow 3^- \rightarrow \frac{-1}{0^+} = -\infty \end{cases}$

→ در ندارد

الف) $\lim_{x \rightarrow 3} [-3x] - [\omega x] \begin{cases} x \rightarrow 3^+ \rightarrow -10 - 1\omega = -2\omega \\ x \rightarrow 3^- \rightarrow -9 - 1f = -2f \end{cases}$

ω

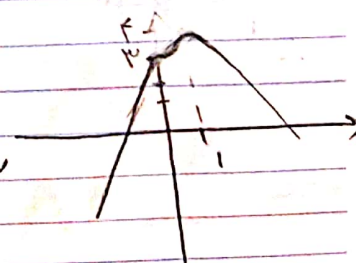
ب) $\lim_{x \rightarrow (-\frac{1}{f})^-} \left[\frac{-1}{x^f} \right] \rightarrow [(-1f)^+] = -1f$

$x \rightarrow (-\frac{1}{f})^- \rightarrow x < -\frac{1}{f} \rightarrow x^f > \frac{1}{1f} \rightarrow \frac{1}{x^f} < 1f \rightarrow \frac{-1}{x^f} > -1f$

الف) $\lim_{x \rightarrow 1} [fx^3 - 3x^2 + 3] \quad y' = -12x^2 + 12x^2 = -12x^2(x-1)$

۹

$\begin{matrix} * & 1 \\ + & + & - \\ \nearrow & \nearrow & \searrow \end{matrix}$



نقطه $x=1$ max است پس در $x=1$ با f برابر است

$\lim_{x \rightarrow 1} [fx^3 - 3x^2 + 3] = [f] = 3$

(ب) $\lim_{x \rightarrow 0} [x^3 - x^2 + 1] = 1$
 $\lim_{x \rightarrow 0^+} [x^+] = 1$
 $\lim_{x \rightarrow 0^-} [x^-] = 1$
 (نشان میدهد الف)

(الف) $\lim_{x \rightarrow 2} \frac{x^3 - 1}{x^2 - 4}$

$\lim_{x \rightarrow 2^+} \frac{x^3 - 1}{x^2 - 4} = \lim_{x \rightarrow 2^+} \frac{(x-1)(x^2 + x + 1)}{(x-2)(x+2)} = \frac{12}{4} = 3$

$\lim_{x \rightarrow 2^-} \frac{-(x^3 - 1)}{x^2 - 4} = \lim_{x \rightarrow 2^-} \frac{-(x-1)(x^2 + x + 1)}{(x-2)(x+2)} = \frac{-12}{4} = -3$

(ب) $\lim_{x \rightarrow \pi} \frac{\sin x}{\sin 2x}$

$\lim_{x \rightarrow \pi^+} \frac{-\sin x}{2 \sin x \cos x} = \lim_{x \rightarrow \pi^+} \frac{-1}{2 \cos x} = \frac{1}{2}$

$\lim_{x \rightarrow \pi^-} \frac{\sin x}{2 \sin x \cos x} = \lim_{x \rightarrow \pi^-} \frac{1}{2 \cos x} = \frac{-1}{2}$

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

$\lim_{x \rightarrow \frac{\pi}{2}^+} \sqrt{\cos x} = 0 \rightarrow \lim_{x \rightarrow \frac{\pi}{2}^+} \sqrt{\cos x} = 0$

$\lim_{x \rightarrow \frac{\pi}{2}^-} \sqrt{\cos x} = 0 \rightarrow \lim_{x \rightarrow \frac{\pi}{2}^-} \sqrt{\cos x} = 0$

(ب) $\lim_{x \rightarrow 0} \sqrt{x - 2\sqrt{x}}$ تعریف نشده
 $x = \frac{1}{100}$

$\lim_{x \rightarrow 0^+} \sqrt{\frac{1}{100} - 2\sqrt{\frac{1}{100}}} = \sqrt{\frac{1}{100} - \frac{2}{10}} = \sqrt{\frac{-19}{100}}$ تعریف نشده

مراکز اصلی پاسخگویی در شهر اصفهان: ۱- ردانی پور، ۲- خرازی، ۳- خاتم الانبیاء، ۴- استقلال، ۵- بهارستان
 شهادت میرزا تقی خان امیر کبیر

۱) $\lim_{x \rightarrow 0^+} \frac{(-1)^{\lfloor \sin x \rfloor}}{x^3 - x^2} \rightarrow \frac{-1^{\lfloor 0^+ \rfloor}}{x^3 - x^2} = \frac{1}{x^3 - x^2} = \frac{1}{0^-} = -\infty$ (۴)

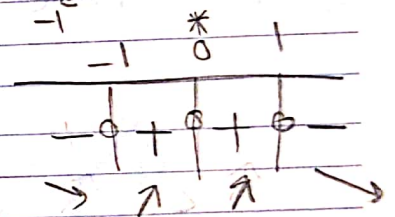
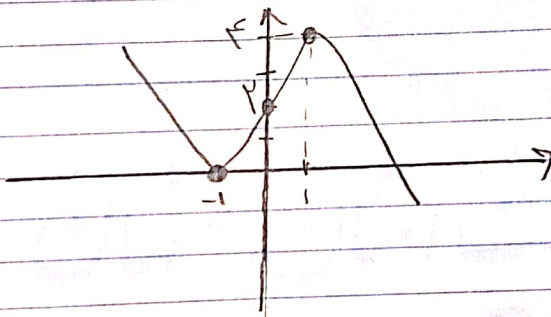
۲) $\lim_{x \rightarrow 2} \frac{x^2 - \lfloor x^2 \rfloor}{x - \lfloor x \rfloor}$

$x \rightarrow 2^+, \lim_{x \rightarrow 2^+} \frac{x^2 - 4}{x - 2} = \lim_{x \rightarrow 2^+} \frac{(x-2)(x+2)}{x-2} = \lim_{x \rightarrow 2^+} x+2 = 4$

$x \rightarrow 2^-, \lim_{x \rightarrow 2^-} \frac{x^2 - 4}{x - 2} = \frac{4 - 4}{2 - 2} = \frac{0}{0} = 1$

۱) $y = \omega x^3 - x^2 \omega + 2$

$y' = -\omega x^2 + 2\omega x = -\omega x^2 (x-1)(x+1)$



۲) $y = x^3 - x^2 + 2$ $y' = 3x^2 - 2x = x(3x-2) = x(3x-2)(x+1)$

