

الف) $\lim_{x \rightarrow \mu^+} \frac{\mu x + \omega}{x+1} = \frac{\mu}{\mu} = \boxed{\mu}$ ب) $\lim_{x \rightarrow \mu^-} \frac{\mu x + \omega}{x+1} = \frac{\mu}{\mu} = \boxed{\mu}$ ①

ج) $\lim_{x \rightarrow \mu} \frac{\mu x + \omega}{x+1} = \frac{\mu}{\mu} = \boxed{\mu}$ د) $\lim_{x \rightarrow 0} \frac{\mu x + \nu}{[x^\mu]} = \frac{\nu}{0} = \text{تعريف نشده}$ ②

الف) $\lim_{x \rightarrow \mu^-} \mu[x] - \nu = \varepsilon(\mu) - \nu = \boxed{\nu}$ ب) $\lim_{x \rightarrow \mu^-} [\varepsilon x - \nu] = \boxed{\nu}$ ③

ج) $\left[\lim_{x \rightarrow \mu^-} \mu x - \nu \right] = \boxed{10}$ د) $\left[\lim_{x \rightarrow \mu^+} \mu x - \nu \right] = \boxed{10}$ ④

الف) $\lim_{x \rightarrow \mu^-} \frac{\mu[x] + 1}{\mu} = \frac{\mu(\mu) + 1}{\mu} = \boxed{\mu, \delta}$ ب) $\lim_{x \rightarrow \mu^-} \left[\frac{\mu x + 1}{\mu} \right] = \boxed{\mu}$ ⑤

ج) $\left[\lim_{x \rightarrow \mu^-} \frac{\mu x + 1}{\mu} \right] = \boxed{\delta}$ د) $\left[\lim_{x \rightarrow \mu^+} \frac{\mu x + 1}{\mu} \right] = \boxed{\delta}$ ⑥

الف) $\lim_{x \rightarrow 1} \frac{x - \delta}{x^2 - 4x + \delta} = \begin{cases} \rightarrow x \rightarrow 1^- \Rightarrow \frac{-\kappa}{0^+} = -\infty \\ \rightarrow x \rightarrow 1^+ \Rightarrow \frac{-\kappa}{0^-} = +\infty \end{cases}$ ⑦

ب) $\lim_{x \rightarrow \mu} \frac{x - \kappa}{\frac{x^2 - 4x + 4}{(x - \mu)^\mu}} = \frac{-1}{0^+} = -\infty$ ⑧

← مخرج 0 داره پس ص 0 بزاریم ص 0 حاصل میشه. -∞ -∞ پس میشه.

عین پای

✓

(الف) $\lim_{x \rightarrow p} \frac{|x^p - 1|}{x^p - 1} =$

$\rightarrow x \rightarrow p^+ \rightarrow \frac{x^p - 1}{x^p - 1} = \frac{(x-1)(x^{p-1} + x^{p-2} + \dots + 1)}{(x-1)(x+1)} = \frac{1^p}{1} = \boxed{1}$

$\rightarrow x \rightarrow p^- \rightarrow \frac{1 - x^p}{x^p - 1} = \frac{(-1)(x^{p-1} + x^{p-2} + \dots + 1)}{(x-1)(x+1)} = \boxed{-1}$

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

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

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

^

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

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

$\rightarrow x \rightarrow \frac{\pi}{2}^- \rightarrow$ تعریف نشده $\cos x$ منفی شده $\leftarrow$ تعریف نشده

1/0

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

$\rightarrow x \rightarrow 0^+ \rightarrow \sqrt{x - 2\sqrt{x}} = 0$

$\lim_{x \rightarrow 0} \sqrt{x - 2\sqrt{x}} =$ تعریف نشده $\rightarrow x \rightarrow 0^- \rightarrow$ تعریف نشده

دارد هم جمع داشته

عن های

(I) $x > 0$ (II) $x < 0$ $\rightarrow x > 4$ $\rightarrow \frac{0}{+1-1+}$ $x - 2\sqrt{x} \geq 0 \rightarrow \sqrt{x}(\sqrt{x} - 2) \geq 0 \rightarrow$ دامنه : $x = 0$ یا $x > 4 \rightarrow (I) \cap (II) \rightarrow$ همه تابع در نقاط اطراف صفر تعریف نه شود.

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به تاریخ		

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

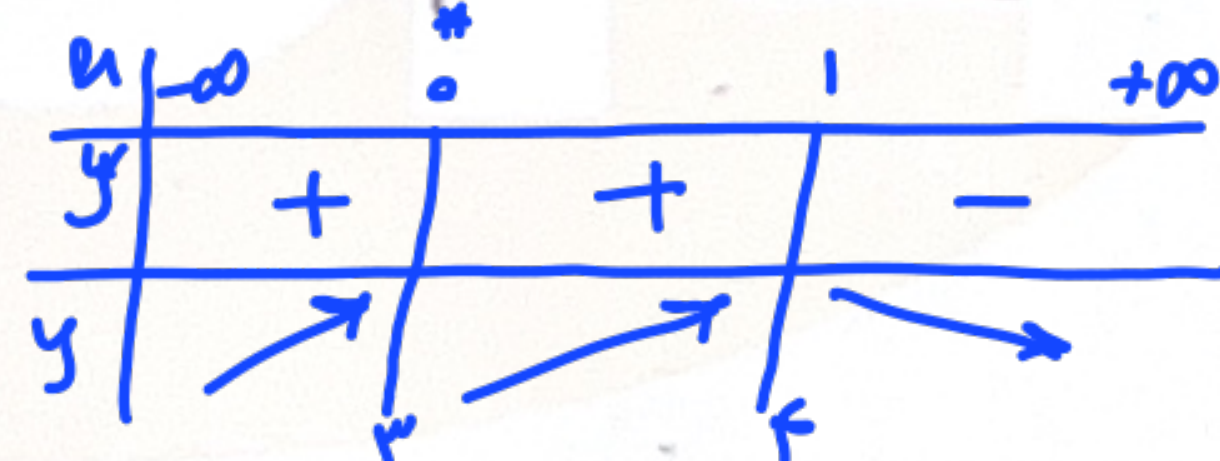
(ب) $\lim_{x \rightarrow 1} \frac{x^2 - \lfloor x^2 \rfloor}{x - \lfloor x \rfloor}$

$x \rightarrow 1^+ = \frac{x^2 - 1}{x - 1} = x + 1 = 2$

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

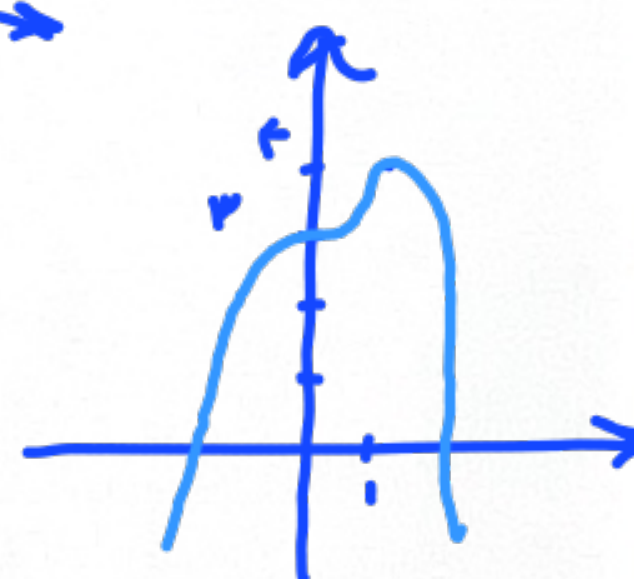
الف $\lim_{x \rightarrow 1} [x^3 - 3x^2 + 3] \rightarrow \lim_{x \rightarrow 1} [x^3] = 1$

$y = x^3 - 3x^2 + 3 \rightarrow y' = 3x^2 - 6x \xrightarrow{y'=0} 3x^2(1-x) = 0 \rightarrow \begin{cases} x=0 \\ x=1 \end{cases}$



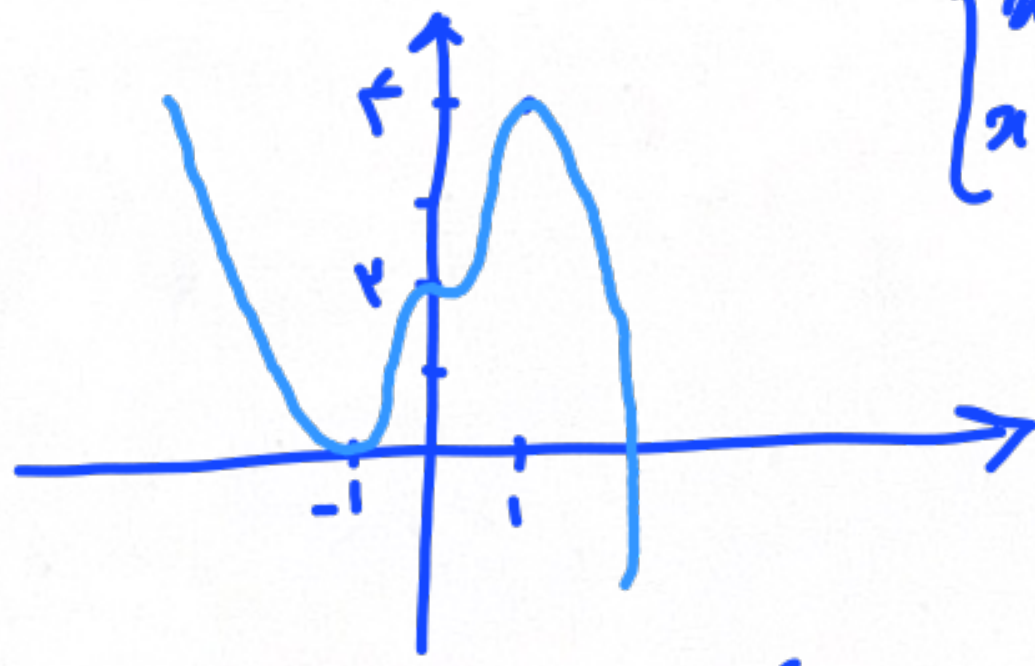
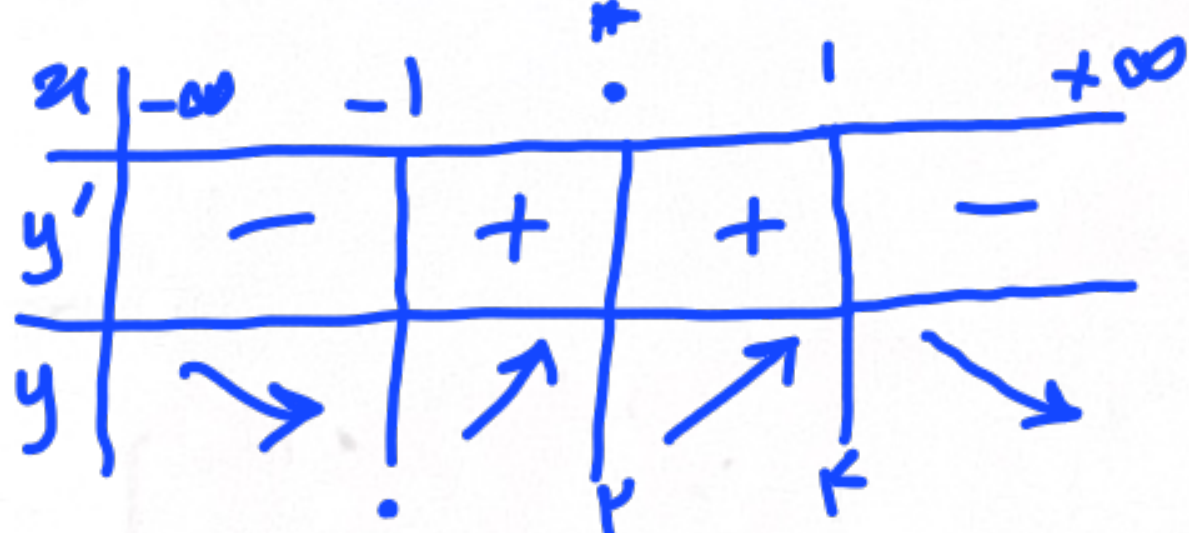
سوال ۴

ب $\lim_{x \rightarrow 0} [x^3 - 3x^2 + 3] = \begin{cases} \lim_{x \rightarrow 0^+} [x^3] = 0 \\ \lim_{x \rightarrow 0^-} [x^3] = 0 \end{cases}$



الف $y = 5x^3 - 3x^2 + 1$

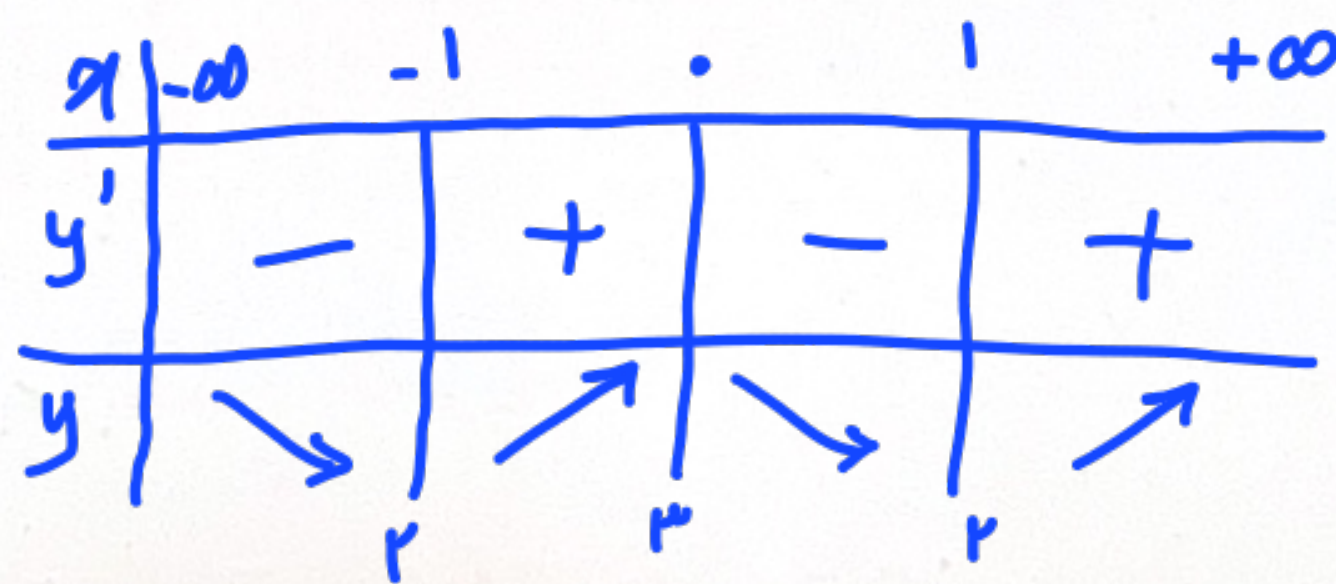
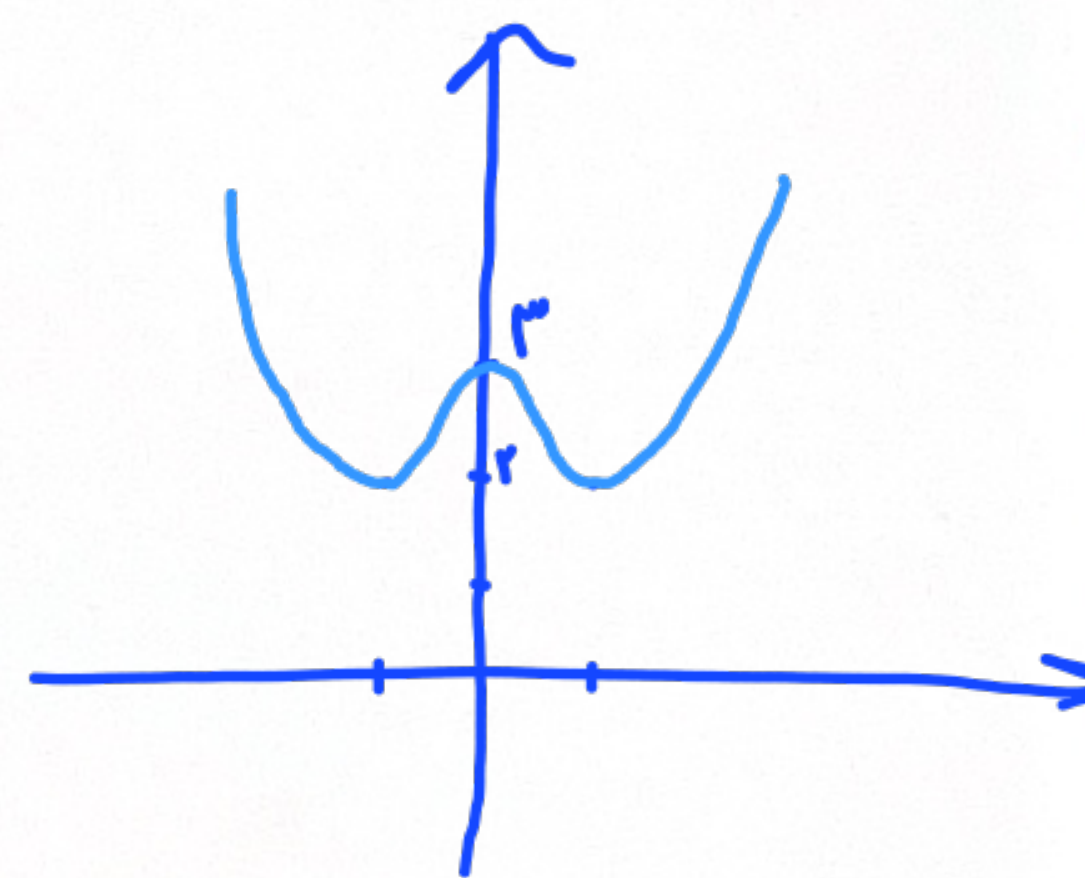
$y' = 15x^2 - 6x \xrightarrow{y'=0} 3x(5x-2) = 0 \rightarrow \begin{cases} x=0 \\ x=2/5 \end{cases}$



سوال ۱۰

ب $y = x^4 - 2x^2 + 3$

$y' = 4x^3 - 4x \xrightarrow{y'=0} 4x(x^2-1) = 0 \rightarrow \begin{cases} x=0 \\ x=1 \\ x=-1 \end{cases}$



الف) $\lim_{x \rightarrow -\mu} [-\mu x] - [\Delta x] \rightarrow x = -\mu^+ \rightarrow 1 + 1\Delta = \mu\mu$

$x \rightarrow -\mu$

$\rightarrow x = -\mu^- \rightarrow 1 + 1\Delta = \mu\Delta$

$\lim_{x \rightarrow (-\frac{1}{\mu})^-} \left[\frac{-1}{x^k} \right] = -14$

$\rightarrow \lim_{x \rightarrow (-\frac{1}{\mu})^-} \left[\frac{-1}{x^k} \right] \rightarrow -14$

$x < -\frac{1}{\mu} \rightarrow x^k > \frac{1}{14} \rightarrow -x^k < \frac{1}{14} \rightarrow -\frac{1}{x^k} > -14$

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