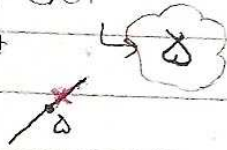


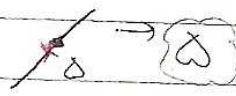
۲۰

الف) $\lim_{x \rightarrow 2^+} \varepsilon_{x=2}$



حاصل

ب) $\lim_{x \rightarrow 2^-} \varepsilon_{x=2}$



۵

1

الف) $\lim_{x \rightarrow 2^b} \varepsilon [x] - 2$

$x \rightarrow 2^b$

$x \rightarrow 2^b \rightarrow [x] = 2$

$\varepsilon_{x=2} - 2$

! نتیجه



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

$x \rightarrow 2^-$

$x \rightarrow 2^- \rightarrow [x] = 1$

$\varepsilon_{x=1} - 2$



۵

2

الف) $\lim_{x \rightarrow 2^b} \varepsilon_{x=2}$

$x \rightarrow 2^b$

$x > 2$

$\varepsilon_{x=2}$

$\varepsilon_{x=2} < \delta$

$\{\varepsilon_{x=2}\} \supset \delta$

! نتیجه

ب) $\lim_{x \rightarrow 2^-} \varepsilon_{x=2}$

$x \rightarrow 2^-$

$x < 2$

$\varepsilon_{x=2} < \delta$

$\{\varepsilon_{x=2}\} = \delta$

۵

3

الف) $\left[\lim_{x \rightarrow 2^b} \varepsilon_{x=2} \right]$

حاصل

$x > 2$

$\varepsilon_{x=2}$

$\varepsilon_{x=2} < \delta \xrightarrow{\text{Lim}} \delta \xrightarrow{\varepsilon_2} \delta$

ب) $\left[\lim_{x \rightarrow 2^-} \varepsilon_{x=2} \right]$

$x < 2$

$\varepsilon_{x=2}$

$\varepsilon_{x=2} < \delta \xrightarrow{\text{Lim}} \delta \xrightarrow{\varepsilon_2} \delta$

۵

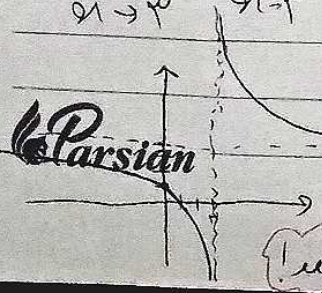
4

الف) $\lim_{x \rightarrow 2} \varepsilon_{x=2}$

$D_f = \mathbb{R} - \{2\}$

نقطه حذف شده از دامنه

Parsian



! نتیجه

ب) $\lim_{x \rightarrow 2} \frac{\varepsilon_{x=2}}{(x-2)^2}$

$x \rightarrow 2$

$\frac{a}{0^+} = +\infty$

$\frac{a}{0^-} = -\infty$

! نتیجه

نتیجه در صورتی که

۵

5

الف) $\lim_{x \rightarrow 3} \frac{x^2 - 3}{\sqrt{x} - 3}$ ب) $\lim_{x \rightarrow 3} \frac{x^2 - 9}{\sqrt{x} - 3}$

$\frac{x^2 - 3}{\sqrt{x} - 3} \xrightarrow{\text{مربع}}$ $\frac{x^2 - 9}{(\sqrt{x} - 3)(\sqrt{x} + 3)} = \frac{(x-3)(x+3)}{(\sqrt{x} - 3)(\sqrt{x} + 3)}$
 $\xrightarrow{\text{مربع}}$ $\frac{x^2 - 9}{x - 9} = \frac{(x-3)(x+3)}{(x-3)(x+3)} = \frac{x+3}{x+3} = 1$

ب) $\frac{x^2 - 9}{\sqrt{x} - 3} \xrightarrow{\text{مربع}}$ $\frac{(x-3)(x+3)}{(\sqrt{x} - 3)(\sqrt{x} + 3)}$
 $\xrightarrow{\text{مربع}}$ $\frac{x^2 - 9}{x - 9} = \frac{(x-3)(x+3)}{(x-3)(x+3)} = \frac{x+3}{x+3} = 1$

الف) $\lim_{x \rightarrow 3} \frac{x^2 - 3}{x^2 - 1}$ ب) $\lim_{x \rightarrow 3} \frac{x^2 - 9}{x^2 - 1}$

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

ب) $\frac{x^2 - 9}{x^2 - 1} \xrightarrow{\text{مربع}}$ $\frac{(x-3)(x+3)}{(x-1)(x+1)}$
 $\xrightarrow{\text{مربع}}$ $\frac{x^2 - 9}{x^2 - 1} = \frac{(x-3)(x+3)}{(x-1)(x+1)}$

الف) $\lim_{x \rightarrow 4} [x^2 - 4]$ ب) $\lim_{x \rightarrow -4} [-x^2 + 4]$

$x^2 - 4 \xrightarrow{\text{مربع}}$ $(x-2)(x+2)$
 $\xrightarrow{\text{مربع}}$ $(4-2)(4+2) = 2 \cdot 6 = 12$

ب) $-x^2 + 4 \xrightarrow{\text{مربع}}$ $-(x^2 - 4) = -(x-2)(x+2)$
 $\xrightarrow{\text{مربع}}$ $-((-4)^2 + 4) = -(16 + 4) = -20$

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

$x^2 - 4x \xrightarrow{\text{مربع}}$ $(x-0)(x-4)$
 $\xrightarrow{\text{مربع}}$ $(2-0)(2-4) = 2 \cdot (-2) = -4$

ب) $4x - x^2 \xrightarrow{\text{مربع}}$ $(4-0)(3-0) = 4 \cdot 3 = 12$

الف) $\lim_{x \rightarrow 2} |x - 2|$ ب) $\lim_{x \rightarrow 1} \frac{x - [x]}{x^2 - 1}$

$|x - 2| \xrightarrow{\text{مربع}}$ $(x-2)$
 $\xrightarrow{\text{مربع}}$ $|2 - 2| = 0$

ب) $\frac{x - [x]}{x^2 - 1} \xrightarrow{\text{مربع}}$ $\frac{x - 1}{(x-1)(x+1)} = \frac{1}{x+1}$
 $\xrightarrow{\text{مربع}}$ $\frac{1}{1+1} = \frac{1}{2}$