نام و نام خانوادگی: پارسا ایروانی

۱۸

کلاس یازدهم پسر B - تکلیف شماره ۲۹

۱- (۲)

$\lim_{x\to 2^+} \varepsilon x - 3 = \varepsilon(2) - 3 = 8 - 3 = 5$ ✓ $\lim_{x\to 2^-} \varepsilon x - 3 = \varepsilon(2) - 3 = 8 - 3 = 5$ ✓ $\Longrightarrow \lim_{x\to 2} \varepsilon x - 3 = 5$

۲- (۲)

$\lim_{x\to 2^+} \varepsilon[x] - 3 = \varepsilon[2^+] - 3 = \varepsilon(2) - 3 = 8 - 3 = 5$ ✓ $\lim_{x\to 2^-} 4[x] - 3 = 4[2^-] - 3 = 4\varepsilon(1) - 3 = 4 - 3 = 1$ ✓

۳- (۲)

$\lim_{x\to 2^+} [\varepsilon x - 3] = [\varepsilon(2^+) - 3] = [5^+] = 5$ ✓ (صعودی) $\lim_{x\to 2^-} [\varepsilon x - 3] = [\varepsilon(2^-) - 3] = [5^-] = 4$ ✓ (صعودی)

۴- (۲)

$\left[\lim_{x\to 2^+} \varepsilon x - 3\right] = [\varepsilon(2) - 3] = [5] = 5$ ✓ $\left[\lim_{x\to 2^-} \varepsilon x - 3\right] = [\varepsilon(2) - 3] = [5] = 5$ ✓

۵- (۲)

$\lim_{x\to 3} \frac{\varepsilon x - 3}{x - 3}$ ~~> شکل‌زایی $\Rightarrow \lim_{x\to 3^+} \frac{\varepsilon x - 3}{x - 3} = +\infty$ ✓, $\lim_{x\to 3^-} \frac{\varepsilon x - 3}{x - 3} = -\infty$ ✓ $\Rightarrow \lim_{x\to 3} \frac{\varepsilon x - 3}{x - 3}$ وجود ندارد

$\lim_{x\to 3^+} \frac{\varepsilon x - 3}{(x-3)^2} = +\infty$ ✓, $\lim_{x\to 3^-} \frac{\varepsilon x - 3}{(x-3)^2} = +\infty$ ✓ $\Longrightarrow \lim_{x\to 3} \frac{\varepsilon x - 3}{(x-3)^2} = +\infty$

۶- (۱٫۵)

$\lim_{x\to 3^+} \frac{\varepsilon x - 3}{\sqrt{x-3}} = +\infty$ ✓ $\lim_{x\to 3^-} \frac{\varepsilon x - 3}{\sqrt{x-3}}$ وجود ندارد ✓ $\Rightarrow \sqrt{x-3} \Rightarrow x - 3 > 0 \Rightarrow x > 3$ $3^- < 3 < 3^+ \Rightarrow \lim \frac{\varepsilon x - 3}{\sqrt{x-3}}$ وجود ندارد

$\lim_{x\to 3^+} \frac{\varepsilon x - 3}{\sqrt{x^2 - \varepsilon x + 3}}$ ~~> $\sqrt{x^2 - \varepsilon x + 3} = \sqrt{(x-3)(x-1)} \Rightarrow (x-3)(x-1) > 0 \Rightarrow$ وجود ندارد

$3^+ \to \frac{9}{\sqrt{0^+}} = +\infty$, $3^- \to \frac{9}{\sqrt{0^-}}$ تن

	1		3	
	+	−		+

$\Rightarrow \lim_{x\to 3} \frac{\varepsilon x - 3}{\sqrt{x^2 - \varepsilon x + 3}}$ وجود ندارد

۷- (۲)

$\lim_{x\to 3^+} \frac{\varepsilon x - 3}{x^2 - 7x + 12} = -\infty$ ✓, $\lim_{x\to 3^-} \frac{\varepsilon x - 3}{x^2 - 7x + 12} = +\infty$ ✓ $\Rightarrow \lim_{x\to 3} \frac{\varepsilon x - 3}{x^2 - 7x + 12}$ وجود ندارد

$\lim_{x\to 3^+} \frac{\varepsilon x - 3}{[x-3]} = \frac{12-3}{[3^+ - 3]} = \frac{9}{[0^+]} = \frac{9}{0}$ وجود ندارد ✓

$\lim_{x\to 3^-} \frac{\varepsilon x - 3}{[x-3]} = \frac{12-3}{[3^- - 3]} = \frac{9}{[0^-]} = \frac{9}{-1} = -9$ ✓ $\Rightarrow \lim_{x\to 3} \frac{\varepsilon x - 3}{[x-3]}$ وجود ندارد

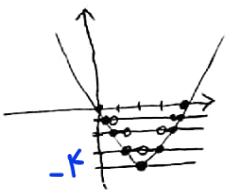
۸- (۲)

$\lim_{x\to 3^+} [3x] + [-2x] = [9^+] + [-6^-] = 9 - 7 = 2$ $\lim_{x\to 3^-} [3x] + [-2x] = [9^-] + [-6^+] = 8 - 6 = 2$ ✓ $\Rightarrow \lim_{x\to 3} [3x] + [-2x] = 2$ ✓

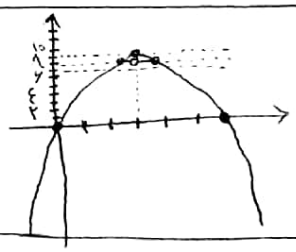
$\lim_{x\to -6^+} [-\varepsilon x] + [2x] = [24^-] + [-12^+] = 23 - 12 = 11$ $\lim_{x\to -6^-} [-\varepsilon x] + [2x] = [24^+] + [-12^-] = 24 - 13 = 11$ ✓ $\Rightarrow \lim_{x\to -6} [-\varepsilon x] + [2x] = 11$ ✓

۹- (۱٫۵)

$\lim_{x\to 2} [x^2 - \varepsilon x] = -5$ ~~> $[-4^+] = -4$



$\lim_{x\to 3} [8x - x^2] = 15$ ✓



۱۰- (۱)

$\lim_{x\to 2^-} \frac{|x-2|}{x^2 - 3x + 2} = \frac{-x+2}{x^2 - 3x + 2} \overset{\frac{0}{0}\ \text{H.O.P}}{=} \frac{-1}{2x - 3} = \frac{-1}{4-3} = -1$ ✓

$\lim_{x\to 2^+} \frac{|x-2|}{x^2 - 3x + 2} = \frac{x-2}{x^2 - 3x + 2} \overset{\frac{0}{0}\ \text{H.O.P}}{=} \frac{1}{2x - 3} = \frac{1}{4-3} = 1$ ✓

$\Rightarrow \lim_{x\to 2} \frac{|x-2|}{x^2 - 3x + 2}$ وجود ندارد

$\lim_{x\to 1^-} \frac{x - [x]}{x^2 - 1} = \frac{1^-}{1^- - 1} = \frac{1^-}{0^-} = -\infty$

$\lim_{x\to 1^+} \frac{x - [x]}{x^2 - 1} = \frac{1^+ - 1}{(1^+)^2 - 1} = \frac{0^+}{(0^+)^2} = +\infty$

$\Rightarrow \lim_{x\to 1} \frac{x - [x]}{x^2 - 1}$ وجود ندارد

اول باید تکلیف برائت مشخص شه

$\lim_{x\to 1} \frac{x - [x]}{x^2 - 1} = \begin{cases} x \to 1^+ : \frac{x-1}{(x-1)(x+1)} = \frac{1}{2} \\ x \to 1^- : \frac{x}{(x-1)(x+1)} = \frac{1}{0^-} = -\infty \end{cases}$