تکالیف شماره ۲۹ — حل مسئله — تا پایان هفته A

۲۰

۱) الف) $\lim_{x \to 2^+} [x] - 3 = 0$ (۵)

ب) $\lim_{x \to 2^-} [x] - 3 = 0$

۲) الف) $\lim_{x \to 2^+} 4[x] - 3 = 4 \times 2 - 3 = 5$

ب) $\lim_{x \to 2^-} 4[x] - 3 = 4 \times 1 - 3 = 1$ (۵)

۳) الف) $\lim_{x \to 2^+} [x^4 - 3] = 0$

ب) $\lim_{x \to 2^-} [x^4 - 3] = 4$ (۵)

۴) الف) $\left[\lim_{x \to 2^+} x^4 - 3\right] = 0$ ب) $\left[\lim_{x \to 2^-} x^4 - 3\right] = 0$ (۵)

۵) الف) $\lim_{x \to 3} \frac{x^4 - 3}{x - 3}$

$\lim_{x \to 3^+} \frac{x^4 - 3}{x - 3} = \frac{9}{0^+} = +\infty$

$\lim_{x \to 3^-} \frac{x^4 - 3}{x - 3} = \frac{9}{0^-} = -\infty$ (۵)

ب) $\lim_{x \to 3} \frac{x^4 - 3}{(x-3)^2}$

$\lim_{x \to 3^+} \frac{x^4 - 3}{(x-3)^2} = \frac{9}{0^+} = +\infty$

$\lim_{x \to 3^-} \frac{x^4 - 3}{(x-3)^2} = \frac{9}{0^+} = +\infty$

⑥ الف) $\lim_{x\to 3} \frac{6x-3}{\sqrt{x-3}}$

$\lim_{x\to 3^+} \frac{6x-3}{\sqrt{x-3}} = \frac{9}{\sqrt{0^+}} = +\infty$

من راست

$\lim_{x\to 3^-} \frac{6x-3}{\sqrt{x-3}} = \frac{9}{\sqrt{0^-}} =$ ت ن

⑤

ب) $\lim_{x\to 3} \frac{6x-3}{\sqrt{x^2-6x+9}}$

$\lim_{x\to 3^+} \frac{6x-3}{\sqrt{x^2-6x+9}} = \frac{9}{\sqrt{(x-1)(x-5)}} = \frac{9}{\sqrt{0^+}} = +\infty$

	1		3	
+	‖	−	‖	+

من راست

$\lim_{x\to 3^-} \frac{6x-3}{\sqrt{x^2-6x+9}} = \frac{9}{\sqrt{0^-}} =$ ت ن

⑦ الف) $\lim_{x\to 3} \frac{6x-3}{x^2-7x+12}$

$\lim_{x\to 3^+} \frac{6x-3}{(x-3)(x-4)} = \frac{9}{0^-} = -\infty$

	3		4	
+	‖	−	‖	+

$\lim_{x\to 3^-} \frac{6x-3}{(x-3)(x-4)} = \frac{9}{0^+} = +\infty$

⑤

من راست

ب) $\lim_{x\to 3} \frac{6x-3}{[x-2]}$

$\lim_{x\to 3^+} \frac{6x-3}{[x-2]} = \frac{9}{0} =$ ت ن

من چپ

$\lim_{x\to 3^-} \frac{6x-3}{[x-2]} = \frac{9}{-1} = -9$

⑧ الف) $\lim_{x\to 2} [3x] + [-2x]$

$\lim_{x\to 2^+} [3x] + [-2x] = 9 + (-5) = 4$

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

⑤

صفحه

تاريخ: / /

$\lim_{x\to -4^+}\{-\frac{x}{4}\}+\{\frac{x}{2}\} = 22-11 = 11$

ب) $\lim_{x\to -4}\{-\frac{x}{4}\}+\{\frac{x}{2}\}$ ← $x\to -4^+$

$\lim_{x\to -4^-}\{-\frac{x}{4}\}+\{\frac{x}{2}\} = 24-13 = 11$

$x\to -4^-$

صادق

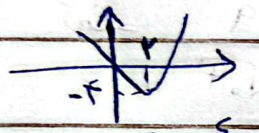
$\lim_{x\to 2^+}\{x^2-\frac{x}{4}\} = \{-2^+\} = -2$

(9) الف) $\lim_{x\to 2}\{x^2-\frac{x}{4}\}$ ← $x\to 2^+$

صادق

$\lim_{x\to 2^-}\{x^2-\frac{x}{4}\} = -2$

$x\to 2^-$



$x^2-\frac{x}{4}$: $+$ | $-$ | $+$ at 0 and $\frac{1}{4}$

$\frac{-b}{2a} = \frac{\frac{1}{4}}{2} = \frac{1}{8}$

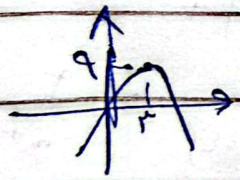
$\lim_{x\to 2^+}\{4x-x^2\} = 8$

ب) $\lim_{x\to 2}\{4x-x^2\}$ ← $x\to 2^+$

صادق

$\lim_{x\to 2^-}\{4x-x^2\} = 8$

$x\to 2^-$



$-x^2+4x$: $-$ | $+$ | $-$ at 0 and 4

$\frac{-b}{2a} = \frac{-4}{-2} = 2$ at $\frac{2}{9}$

(10) الف) $\lim_{x\to 2}\frac{|x-2|}{x^2-3x+2} = \frac{0}{0}$ ← انفرادی

$\lim_{x\to 2^+}\frac{|x-2|}{(x-2)(x-1)} = \frac{x-2}{(x-2)(x-1)} = \frac{1}{x-1} = 1$

$\lim_{x\to 2^-}\frac{|x-2|}{(x-2)(x-1)} = \frac{-x+2}{(x-2)(x-1)} = \frac{-1}{x-1} = -1$

(7)

صادق

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

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

$\frac{1}{x+1} = \frac{1}{2}$

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