مهرنیا ربیعی　　دوازدهم تجربی B　　تکلیف شماره ۱۸

1

$\lim_{x\to 2^+} \frac{2x+5}{x+1} = \frac{9}{3} = 3$　　$\lim_{x\to 2^-} \frac{2x+5}{x+1} = \frac{9}{3} = 3$　　$\lim_{x\to 0} \frac{2x+7}{[x^2]}$

$\lim_{x\to 2} \frac{2x+5}{x+1}$ → $\lim_{x\to 2^+} \frac{2x+5}{x+1} = \frac{9}{3} = 3$ ، $\lim_{x\to 2^-} \frac{2x+5}{x+1} = \frac{9}{3} = 3$ $\Big\}$ $\lim \frac{2x+5}{x+1} = 3$

$\lim_{x\to 0} \frac{2x+7}{[x^2]}$ → $\lim_{x\to 0^+} \frac{2x+7}{[x^2]} = \frac{2x+7}{0}$ ت.ن

$\lim_{x\to 0^-} \frac{2x+7}{[x^2]} = \frac{2x+7}{[(0^-)^2]} = \frac{2x+7}{[0^+]} =$ ت.ن

2

$\lim_{x\to 3^-} 4[x]-2 = 4(2)-2 = 6$　　$\lim_{x\to 3^-} [4x-2] = \lim_{x\to 3^-} [12^- - 2] = \lim_{x\to 3^-} [10^-] = 9$

$\left[\lim_{x\to 3^-} 4x-2\right] = 10$　　$\left[\lim_{x\to 3^+} 4x-2\right] = 10$

3

$\lim_{x\to 3^-} \frac{3[x]+1}{2} = \frac{3(2)+1}{2} = \frac{7}{2} = 3.5$　　$\lim_{x\to 3^-} \left[\frac{3x+1}{2}\right] = \lim_{x\to 3^-} \left[\frac{10^-}{2}\right] = 4$

$\left[\lim_{x\to 3^-} \frac{3x+1}{2}\right] = \left[\lim_{x\to 3^-} \frac{10}{2}\right] = 5$　　$\left[\lim_{x\to 3^+} \frac{3x+1}{2}\right] = 5$

4

$\lim_{x\to 1} \frac{x-5}{x^2-6x+5}$ → $\lim_{x\to 1^-} \frac{x-5}{(x-5)(x-1)} = \lim_{x\to 1^-} \frac{1}{x-1} = -\infty$

$\lim_{x\to 1^+} \frac{x-5}{(x-5)(x-1)} = \lim_{x\to 1^+} \frac{1}{x-1} = +\infty$

$\lim_{x\to 3} \frac{x-4}{(x-3)^2} = \frac{-1}{0^+} = -\infty$

5

$\lim_{x\to -3} [-3x]-[5x]$ → $\lim_{x\to -3^+} [-3x]-[5x] = [9^-] - [-15^+] = 8+15 = 23$

$\lim_{x\to -3^-} [-3x]+[5x] = [9^+] - [-15^-] = 9+16 = 25$

$\lim_{x\to (\frac{-1}{2})^-} \left[\frac{-1}{x^4}\right] = -16$ $\left(x < \frac{-1}{2} \quad x^4 > \frac{1}{16} \quad \frac{1}{x^4} < 16 \quad \frac{-1}{x^4} > -16\right)$

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$$\lim_{x\to 1}\left[4x^3-3x^4+3\right]=3 \qquad \lim_{x\to 0}\left[4x^3-3x^4+3\right]$$

$$f'(x)=12x^2-12x^3=-12x^2(x-1) \qquad \lim_{x\to 0^+}[3^+]=3 \qquad \lim_{x\to 0^-}[3^-]=2$$

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$$\lim_{x\to 2}\frac{|x^3-8|}{x^2-4}$$

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

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

$$\lim_{x\to \pi}\frac{|\sin x|}{\sin 2x}$$

حد ندارد

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

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

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$$\lim_{x\to \frac{3\pi}{2}}\sqrt{\cos x}$$

$$\lim_{x\to \frac{3\pi}{2}^+}\sqrt{\cos x}=\lim 0=0$$

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$$\lim_{x\to \frac{3\pi}{2}^-}\sqrt{\cos x}=\text{ت.ن}$$

$$\lim_{x\to 0}\sqrt{x-2\sqrt{x}}$$

$$\lim_{x\to 0^+}\sqrt{x-2\sqrt{x}}=\text{ت.ن} \qquad 0<x<1 \to \sqrt{x}>x \qquad x-2\sqrt{x}<0$$

$$\lim_{x\to 0^-}\sqrt{x-2\sqrt{x}}=\text{ت.ن}$$

۹

$$\lim_{x\to 0^+}\frac{(-1)^{[\sin x]}}{x^3-x^2}=\frac{(-1)^{[0^+]}}{x^2(x-1)}=\frac{(-1)^0}{x^2(x-1)}=\frac{1}{x^2(x-1)}=-\infty$$

$$\lim_{x\to 2}\frac{x^2-[x^2]}{x-[x]}$$

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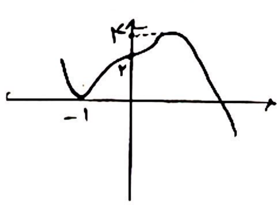
$$\lim_{x\to 2^+}\frac{x^2-[x^2]}{x-[x]}=\frac{x^2-4}{x-2}=x+2=4$$

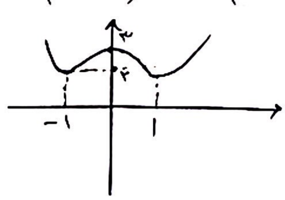
$$\lim_{x\to 2^-}\frac{x^2-[x^2]}{x-[x]}=\frac{x^2-3}{x-1}=\frac{4-3}{2-1}=1$$

۱۰

$$y=5x^3-3x^5+2 \xrightarrow{\text{مشتق}} 15x^2-15x^4=-15x^2(x^2-1)=-15x^2(x-1)(x+1)$$

	-1		0		1	
$-$		$+$		$+$		$-$





	-1		0		1	
$-$		$+$		$-$		$+$

$$y=x^4-2x^2+3 \longrightarrow f'(x)=4x^3-4x=4x(x^2-1)=4x(x-1)(x+1)$$