۱۹٫۵ آفرین به شما

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①

$\lim_{x\to 2^+} \frac{2x+5}{x+1} = \frac{9}{3} = 3 \qquad \lim_{x\to 2^-} \frac{2x+5}{x+1} = \frac{9}{3} = 3$ ۲

$\lim_{x\to 2} \frac{2x+5}{x+1} = 9/3 = 3$

$\lim_{x\to 0} \frac{2x+7}{[x^2]}$ → 0^+: $\frac{2x+7}{0}$ = حن ; 0^-: $\frac{2x+7}{x}$ = حن

②

$\lim_{x\to 3^-} 4[x]-2 \longrightarrow 2\times 4 - 2 = 6 \qquad \lim_{x\to 3^-} [4x-2] = [10^-] = 9$

$\left[\lim_{x\to 3^-} 4x-2\right] = 10 \qquad \left[\lim_{x\to 3^+} 4x-2\right] = 10$ ۲

③

$\lim_{x\to 3^-} \frac{3[x]+1}{2} = \frac{6+1}{2} = 3.5 \qquad \lim_{x\to 0^-} \left[\frac{10^-}{2}\right] = 4$ ۲

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

④

$\lim \frac{x-5}{x^2-6x+5}$; $(x-1)(x-5)$

1^+: $\frac{-4}{0^-} = +\infty$; 1^-: $\frac{-4}{0^+} = -\infty$

1 5 : + | − | +

$\lim_{x\to 3} \frac{x-4}{x^2-6x+9}$; $(x-3)^2$ ۲

3^+: $\frac{-1}{0^+} = -\infty$; 3^-: $\frac{-1}{0^+} = -\infty$

۵

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$\lim_{x \to -3} [-3x] + [5x]$

-3^+ : $8 + 15 = 23$ ✓

-3^- : $9 + 16 = 25$

ب

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

۶

$\lim_{x \to 1} [-3x^4 + 4x^3 + 3] = (3)$

$f'(x) = -12x^3 + 12x^2$

$x^2(-12x + 12) \longrightarrow x = 0 , 1$

	0		1	
+		+		−
↗		↗		↘

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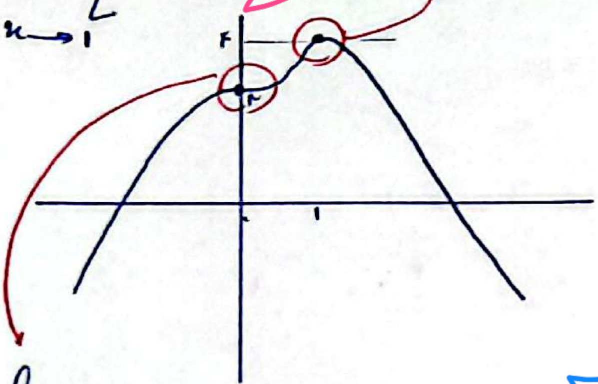

$\lim_{x \to 0} [-3x^4 + 4x^3 + 3] = 2$

$\lim_{x \to 0^+} [y] = 3 \,,\ \lim_{x \to 0^-} [y] = 2$

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

2^+ : $\frac{x^3 - 8}{x^2 - 4} \xrightarrow{H} \frac{3x^2}{2x} = \frac{12}{4} = \frac{3}{2}$ ✓

2^- : $\frac{8 - x^3}{x^2 - 4} \longrightarrow \frac{-3x^2}{2x} = (-3)$

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

π^+ : $\frac{-\sin}{2\sin\cos} = \frac{-1}{2\cos} = \left(\frac{1}{2}\right)$ ✓

ب

π^- : $\frac{+\sin}{2\sin\cos} = \frac{1}{2\cos} = \left(-\frac{1}{2}\right)$

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

$\frac{3\pi}{2}^+$ ۹   ۰

$\frac{3\pi}{2}^-$ ند

د

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

0^+ ند ✓

0^- ند

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

$$x^2(x-1) \longrightarrow \quad - \;|\; - \;|\; + \quad (0,\ 1)$$

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

$$2^+ : \frac{x^2 - 4}{\frac{1}{18}x - 2} = x + 2 \Rightarrow (4)$$

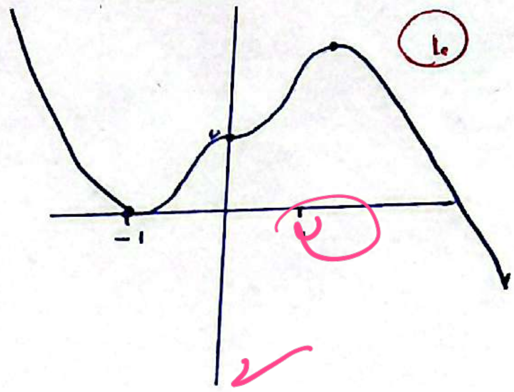
$$2^- : \frac{x^2 - 3}{x - 1} = \frac{2x}{1} = (4) \qquad \frac{2^2 - 3}{2 - 1} = 1$$

چرا hop ؟ ÷ نمی باشد

$$y = -3x^5 + 5x^3 + 2 \longrightarrow -15x^4 + 15x^2$$

$$15(x^2)(-x^2 + 1)$$

	-1		0		1	
−		+		+		−
↘		↗		↗		↘



$$y = x^4 - 2x^2 + 3$$

$$\frac{4x^3 - 4x}{4x(x^2 - 1)}$$

	-1		0		1	
−		+		−		+
↘		↗		↘		↗