

۱۹، ۱۵ آزمون به سه

سازگاری  
۱- حاصل مدها؟

الف)  $\lim_{x \rightarrow 2^+} \frac{x+5}{x+1} = \frac{7}{3} = 3$

ج)  $\lim_{x \rightarrow 2} \frac{x+5}{x+1} = \frac{7}{3} = 3$

ب)  $\lim_{x \rightarrow 2^-} \frac{x+5}{x+1} = \frac{7}{3} = 3$

د)  $\lim_{x \rightarrow 0} \frac{x+1}{[x^2]_{0^+}} = \frac{1}{0} \rightarrow \infty$

الف)  $\lim_{x \rightarrow 3^-} f(x) - 2 = f(3^-) - 2 = 9$

ج)  $\left[ \lim_{x \rightarrow 3^-} f(x) - 2 \right] = 10$

ب)  $\lim_{x \rightarrow 3^-} [f(x) - 2] = 10$

د)  $\left[ \lim_{x \rightarrow 3^+} f(x) - 2 \right] = 10$

الف)  $\lim_{x \rightarrow 3^-} \frac{f(x)+1}{x} = \frac{f(3^-)+1}{3} = \frac{10}{3}$

ج)  $\left[ \lim_{x \rightarrow 3^-} \frac{f(x)+1}{x} \right] = \frac{10}{3}$

ب)  $\lim_{x \rightarrow 3^-} \left[ \frac{f(x)+1}{x} \right] = \frac{10}{3}$

د)  $\left[ \lim_{x \rightarrow 3^+} \frac{f(x)+1}{x} \right] = \frac{10}{3}$

الف)  $\lim_{n \rightarrow 1} \frac{n-5}{n^2-4n+4} = \frac{-4}{-3} = \frac{4}{3}$

ب)  $\lim_{n \rightarrow 2} \frac{n-4}{n^2-4n+4} = \frac{0}{0}$

الف)  $\lim_{n \rightarrow -3} [-f(n)] - [5n] = -1 - (-15) = 14$

ب)  $\lim_{n \rightarrow (-\frac{1}{3})^-} \left[ \frac{-1}{nf} \right] = [-14^+] = -14$

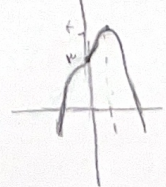
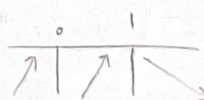
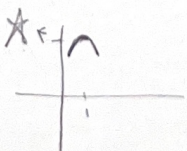
$n < -\frac{1}{f} \rightarrow \frac{1}{nf} < 14 \rightarrow -\frac{1}{nf} > -14$

الف)  $\lim_{n \rightarrow 1} [f(n)^3 - 3n^2 + 2] = [f(1)^3] = [1^3] = 1$

ب)  $\lim_{n \rightarrow 0} [f(n)^3 - 3n^2 + 2] = [f(0)^3] = [2^3] = 8$

$y' = 12n^2 - 12n^3 = 0$   
 $y'' = 24n - 36n^2 = 0 \rightarrow 24 - 36n < 0$

$y' = 12n^2 - 12n^3 = 0$   
 $12n^2(1-n) = 0$



الف)  $\lim_{x \rightarrow 2} \frac{|x^3 - 8|}{x^2 - 4}$

$\xrightarrow{x^+} \frac{(x-2)(x^2+2x+4)}{(x+2)(x-2)} = 3$   
 $\xrightarrow{x^-} \frac{-(x-2)(x^2+2x+4)}{(x+2)(x-2)} = -3$

$x - 2\sqrt{x} \geq 0 \rightarrow \sqrt{x}(\sqrt{x} - 2) \geq 0$   
 $\sqrt{x} \geq 0$   
 $\sqrt{x} - 2 \geq 0 \rightarrow \sqrt{x} \geq 2 \rightarrow x \geq 4$

ب)  $\lim_{n \rightarrow \pi} \frac{|\sin n|}{\sin 2n}$



$\xrightarrow{\pi^+} \frac{-\sin n}{2 \sin n \cos n} = \frac{-1}{2(-1)} = \frac{1}{2}$

$\xrightarrow{\pi^-} \frac{\sin n}{2 \sin n \cos n} = \frac{1}{2(-1)} = -\frac{1}{2}$

II.  $x=0 \leq x \leq 2 \rightarrow$  در این بازه مشتق

$\lim_{x \rightarrow 0} \sqrt{x - 2\sqrt{x}} = *$

الف)  $\lim_{x \rightarrow \frac{\pi}{2}} \sqrt{\cos x}$

$x \rightarrow \frac{\pi}{2}$

$\left(\frac{\pi}{2}\right)^+ \rightarrow \sqrt{\cos\left(\frac{\pi}{2}\right)} = 0$

$\left(\frac{\pi}{2}\right)^- \rightarrow \sqrt{\cos\left(\frac{\pi}{2}\right)} \Rightarrow$  تکریف نشوده



ب)  $\lim_{x \rightarrow 0} \sqrt{x - 2\sqrt{x}}$

$x \rightarrow 0$

$\xrightarrow{0^+} \sqrt{x - 0} = 0$

$\xrightarrow{0^-} \sqrt{x - 2\sqrt{0}} \Rightarrow$  تکریف نشوده

الف)  $\lim_{x \rightarrow 0^+} \frac{(-1)^{[\sin x]}}{x^2 - x^2}$

$\frac{(-1)^0}{0^0} = \frac{1}{0^0} = -\infty$

$\frac{x^2 - 2x}{x^2 - 2x} \rightarrow 0^-$



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

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

۱۰. نمودارهای تابع مشتق را کنید.

الف)  $y = 5x^3 - 3x^5 + 2$

$y' = 15x^2 - 15x^4 \rightarrow 15x^2(1 - x^2)$

$x = -1 \Rightarrow y = -5 + 3 + 2 = 0$

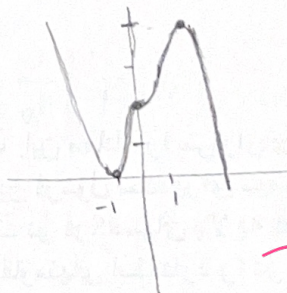
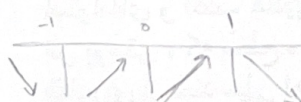
$x = 0 \Rightarrow y = 2$

$x = 1 \Rightarrow y = 5 - 3 + 2 = 4$

$x = 0 \rightarrow$  میناکس

$x = 1$

$x = -1$



ب)  $y = x^4 - 2x^2 + 3$

$y' = 4x^3 - 4x \rightarrow 4x(x^2 - 1)$

$x = 0$

$x = 1$

$x = -1$

$x = 0 \Rightarrow y = 3$

$x = 1 \Rightarrow y = 1 - 2 + 3 = 2$

$x = -1 \Rightarrow y = 1 - 2 + 3 = 2$

$x = -2 \Rightarrow y = 16 - 8 + 3 = 11$

