

نام و نام خانوادگی ..... ۱۶۴۱۶۱ ..... پاسنامه تشریحی تکلیف شماره ۱۸۰ کلاس ۱۲۸

الف)  $\lim_{x \rightarrow \infty} \frac{x+5}{x+1} = \frac{9}{1} = 9$   
 ب)  $\lim_{x \rightarrow -\infty} \frac{x+5}{x+1} = \frac{9}{1} = 9$   
 ج)  $\lim_{x \rightarrow 2} \frac{x+5}{x+1} = \frac{9}{3} = 3$   
 د)  $\lim_{x \rightarrow 0} \frac{x+5}{x+1} = \frac{5}{1} = 5$

الف)  $\lim_{x \rightarrow 2^-} f(x) = 2$   $f(2) = 2 = 2$   
 ب)  $\lim_{x \rightarrow 2^-} [x-2] = \lim_{x \rightarrow 2^-} [0^-] = 0$   
 ج)  $\lim_{x \rightarrow 2^-} x = 2$   $\Rightarrow \lim_{x \rightarrow 2^-} [x] = 2$   
 د)  $\lim_{x \rightarrow 2^+} [x-2] = \lim_{x \rightarrow 2^+} [0^+] = 0$

الف)  $\lim_{x \rightarrow 1} \frac{x^2+1}{x} = \frac{1^2+1}{1} = 2$   
 ب)  $\lim_{x \rightarrow 1^-} \frac{x^2+1}{x} = \lim_{x \rightarrow 1^-} [2^-] = 2$   
 ج)  $\lim_{x \rightarrow 1^+} \frac{x^2+1}{x} = \lim_{x \rightarrow 1^+} [2^+] = 2$   
 د)  $\lim_{x \rightarrow 1} \frac{x^2+1}{x} = 2$

الف)  $\lim_{x \rightarrow \infty} \frac{x-5}{x^2-9x+4} = \frac{-\infty}{\infty} = 0$   
 ب)  $\lim_{x \rightarrow -\infty} \frac{x-5}{x^2-9x+4} = \frac{-\infty}{\infty} = 0$   
 ج)  $\lim_{x \rightarrow 0} \frac{x-5}{x^2-9x+4} = \frac{-5}{4} = -\frac{5}{4}$   
 د)  $\lim_{x \rightarrow 0} \frac{x-5}{x^2-9x+4} = -\frac{5}{4}$

الف)  $\lim_{x \rightarrow 1} [x^2] - [5x] = 1 - 5 = -4$   
 ب)  $\lim_{x \rightarrow 1} \frac{1}{x^2} = 1$   
 ج)  $\lim_{x \rightarrow 1} \frac{1}{x^2} = 1$   
 د)  $\lim_{x \rightarrow 1} \frac{1}{x^2} = 1$

الف)  $\lim_{x \rightarrow 1} [x^3 - 3x^2 + 2] \Rightarrow x^3 - 3x^2 + 2 \Rightarrow \text{مشتق} = 3x^2 - 6x \Rightarrow 1^3 - 1^3 \rightarrow 1 \Rightarrow 0$   
 $\hookrightarrow x \rightarrow 1 \Rightarrow 1 - 3 + 2 = 0$   
 $\hookrightarrow \lim_{x \rightarrow 1} [x^3]$   
 $\Rightarrow \frac{0}{0}$

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ب)  $\lim_{x \rightarrow 0} [x^3 - 3x^2 + 2] \Rightarrow \text{مشتق} = 3x^2 - 6x + 2 \Rightarrow 1^3 - 1^3 \rightarrow 1 \Rightarrow 0$   
 $\hookrightarrow x \rightarrow 0 \Rightarrow 0 - 0 + 2 = 2$   
 $\hookrightarrow \lim_{x \rightarrow 0} [x^3] = 0$

$\lim_{x \rightarrow 2} \frac{x^2 - 1}{x^2 - 4} \Rightarrow \frac{(x-1)(x+1)}{(x+2)(x-2)}$   
 $\hookrightarrow x \rightarrow 2^+ \Rightarrow \frac{(2-1)(2+1)}{(2+2)(2-2)} = \frac{1 \cdot 3}{4 \cdot 0} = \frac{3}{0} = \frac{+}{-} = -\infty$   
 $\hookrightarrow x \rightarrow 2^- \Rightarrow \frac{(2-1)(2+1)}{(2+2)(2-2)} = \frac{1 \cdot 3}{4 \cdot 0} = \frac{3}{0} = \frac{+}{+} = +\infty$

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ج)  $\lim_{x \rightarrow \pi} \frac{|\sin x|}{\sin x} \Rightarrow \frac{|\sin x|}{\sin x} \Rightarrow x \rightarrow \pi^+ \Rightarrow \frac{-\sin}{\sin} = \frac{-1}{-1} = \frac{1}{1} = 1$   
 $\hookrightarrow x \rightarrow \pi^- \Rightarrow \frac{\sin}{\sin} = \frac{1}{1} = \frac{1}{1} = 1$

د)  $\lim_{x \rightarrow \frac{\pi}{2}} \sqrt{x - \frac{\pi}{2}} \Rightarrow \frac{0}{0} \Rightarrow \frac{0^+}{0^+} = 0^+ \Rightarrow 0$   
 $\hookrightarrow \frac{0^-}{0^-} = 0^- \Rightarrow 0$

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هـ)  $\lim_{x \rightarrow 0} \sqrt{x + \sqrt{x}} \Rightarrow 0^+ = \sqrt{0^+} \Rightarrow 0^+ \Rightarrow 0$   
 $\hookrightarrow 0^- = \sqrt{0^-} \Rightarrow 0^- \Rightarrow 0$

و)  $\lim_{x \rightarrow 1} \frac{1}{x^2 - 1} \Rightarrow \frac{1}{x^2 - 1} \Rightarrow \frac{1}{0^-} = -\infty$

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ز)  $\lim_{x \rightarrow 1} \frac{x^2 - [x^2]}{x - [x]} \Rightarrow x \rightarrow 1^+ \Rightarrow \frac{1^2 - 1}{1 - 1} = \frac{0}{0} \Rightarrow \frac{2x}{1} = 2$   
 $\hookrightarrow x \rightarrow 1^- \Rightarrow \frac{1^2 - 1}{1 - 1} = \frac{0}{0} = 1$

ح)  $\lim_{x \rightarrow 1} \omega x^3 - 3\omega x^2 + 2 \Rightarrow \text{مشتق} = 3\omega x^2 - 6\omega x \Rightarrow 1\omega x^3 - 1\omega x^2 \Rightarrow 1\omega x^2(-x+1) \Rightarrow$   
 $-1\omega x^2(x+1)(x-1) \Rightarrow 1 \cdot 1 \cdot 0 = 0 \Rightarrow -1 + 1 + 1 = 1$

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ط)  $\lim_{x \rightarrow 1} x^3 - 3x^2 + 2 \Rightarrow \text{مشتق} = 3x^2 - 6x \Rightarrow 1^3 - 1^3 \Rightarrow 1 \cdot (1-1) = 0$   
 $\hookrightarrow x \rightarrow 1 \Rightarrow 1 - 3 + 2 = 0$