

$$\lim_{x \rightarrow 2} \frac{x^2 + \Delta}{x+1} = \frac{9}{3} = 3 \quad (ج) \quad \lim_{x \rightarrow 2} \frac{x^2 + \Delta}{x+1} = \frac{x^2 + \Delta}{x+1} = 3 \quad (الف) \quad (1)$$

$$\lim_{x \rightarrow 0} \frac{x^2 + V}{[x^2]} \Rightarrow \text{چون } x \rightarrow 0^+ \Rightarrow \frac{0^+ + V}{[0^+]} = \frac{V^+}{0} \quad (د) \quad \lim_{x \rightarrow 0} \frac{x^2 + V}{[x^2]} \Rightarrow \text{چون } x \rightarrow 0^- \Rightarrow \frac{0^- + V}{[0^-]} = \frac{V^-}{0}$$

$$[\lim_{x \rightarrow 2} f(x-2)] = 10 \quad (ج) \quad \lim_{x \rightarrow 2} [f(x-2)] = [12-2] = 9 \quad (د) \quad \lim_{x \rightarrow 2} f(x-2) = f(2) = 4 \quad (الف) \quad (2)$$

$$[\lim_{x \rightarrow 2^+} f(x-2)] = 10 \quad (ج) \quad \lim_{x \rightarrow 2^+} \left[\frac{x^2 + 1}{x} \right] = \left[\frac{9 + 1}{2} \right] = \left[\frac{10}{2} \right] = 5 \quad (د) \quad \lim_{x \rightarrow 2^+} \frac{x^2 + 1}{x} = \frac{x^2 + 1}{x} = \frac{5}{2} \quad (الف) \quad (3)$$

$$\left[\lim_{x \rightarrow 2^+} \frac{x^2 + 1}{x} \right] \Rightarrow \lim_{x \rightarrow 2^+} \frac{x^2 + 1}{x} = \Delta \Rightarrow \left[\lim_{x \rightarrow 2^+} \frac{x^2 + 1}{x} \right] = \Delta \quad (ج) \quad \left[\lim_{x \rightarrow 2^+} \frac{x^2 + 1}{x} \right] \Rightarrow \lim_{x \rightarrow 2^+} \frac{x^2 + 1}{x} = \Delta \Rightarrow \left[\lim_{x \rightarrow 2^+} \frac{x^2 + 1}{x} \right] = \Delta \quad (د)$$

$$\lim_{x \rightarrow 2} \frac{x^2 - 4}{x^2 - 4x + 4} = \frac{x^2 - 4}{(x-2)^2} \quad \begin{matrix} x^+ \rightarrow \frac{-1}{0^+} = -\infty \\ x^- \rightarrow \frac{-1}{0^+} = -\infty \end{matrix} \quad (ج) \quad \lim_{x \rightarrow 2} \frac{x^2 - 4}{x^2 - 4x + 4} = \frac{x^2 - 4}{(x-2)^2} = \frac{1}{x-2} \quad \begin{matrix} x^+ \rightarrow \frac{1}{0^+} = +\infty \\ x^- \rightarrow \frac{1}{0^-} = -\infty \end{matrix} \quad (الف) \quad (4)$$

$$\lim_{x \rightarrow (-\frac{1}{4})^-} \left[\frac{-1}{x^2} \right] = \left[\frac{-1}{(\frac{1}{16})^2} \right] = -14 \quad (ج) \quad \lim_{x \rightarrow -2} [-x^2] = [-\Delta x^2] \quad \begin{matrix} x^+ \rightarrow -10 - 1\Delta = -2\Delta \\ x^- \rightarrow -9 - 1\Delta = -2\Delta \end{matrix} \quad (الف) \quad (5)$$

$$\lim_{x \rightarrow 0} [x^2 - 4x^2 + 3] \quad \begin{matrix} 0^+ \rightarrow [3^+] = 3 \\ 0^- \rightarrow [3^-] = 3 \end{matrix} \quad (ج) \quad \lim_{x \rightarrow 0} [x^2 - 4x^2 + 3] = [3^-] = 3 \quad (الف) \quad (6)$$

$$\lim_{x \rightarrow \pi} \frac{|\sin x|}{\sin 2x} \quad \begin{matrix} x^+ \rightarrow \frac{\sin \pi}{2 \sin \pi \cos \pi} = \frac{1}{2 \cos \pi} = -\frac{1}{2} \\ x^- \rightarrow \frac{-\sin \pi}{2 \sin \pi \cos \pi} = \frac{-1}{2 \cos \pi} = \frac{1}{2} \end{matrix} \quad (ج) \quad \lim_{x \rightarrow 2} \frac{|x^2 - 1|}{x^2 - 4} \quad \begin{matrix} x^+ \rightarrow \frac{(x-1)(x^2 + x + 1)}{(x-2)(x+2)} = \frac{x}{x} = 1 \\ x^- \rightarrow \frac{-(x-1)(x^2 + x + 1)}{(x-2)(x+2)} = -\frac{x}{x} = -1 \end{matrix} \quad (الف) \quad (7)$$

$$\lim_{x \rightarrow 0} \sqrt{x - 2\sqrt{x}} \quad \begin{matrix} x^+ \rightarrow \sqrt{0^+ - 2\sqrt{0^+}} = \sqrt{0^+} = 0^+ \\ x^- \rightarrow \sqrt{0^- + 2\sqrt{0^-}} = 0^- \end{matrix} \quad (ج) \quad \lim_{x \rightarrow \frac{\pi}{2}} \sqrt{\cos x} \quad \begin{matrix} x^+ \rightarrow \sqrt{0^+} = 0^+ \\ x^- \rightarrow \sqrt{0^-} = \text{تعریف نشده} \end{matrix} \quad (الف) \quad (8)$$

$$\lim_{x \rightarrow 2} \frac{x^2 - [x^2]}{x - [x]} \quad \begin{matrix} x^+ \rightarrow \frac{x^2 - x}{x - 1} = \frac{x^2 - x}{x - 1} = x + 1 = 3 \\ x^- \rightarrow \frac{x^2 - 3}{(x-1)} = \frac{1^-}{1^-} = 1 \end{matrix} \quad (ج) \quad \lim_{x \rightarrow 0^+} \frac{(-1)^{[x]}}{x^2 - x^2} = \frac{(-1)^{0^+}}{x^2(x-1)} = \frac{1}{x^2(x-1)} \quad (الف) \quad (9)$$

$$y = x^4 - 2x^2 + 3 \quad (ج) \quad y = \Delta x^4 - 2x^2 + 3 \quad (الف) \quad (10)$$

$$y' = 4x^3 - 4x \quad \begin{matrix} -1 & 0 & 1 \\ -1 & + & 1 & - \end{matrix} \quad y' = -1\Delta x^3 + 1\Delta x^2 \quad \begin{matrix} -1 & 0 & 1 \\ -1 & + & 1 & - \end{matrix}$$

