

الف)  $\lim_{x \rightarrow 2^+} \frac{2x+8}{x+1} = \frac{9}{3} = 3$

ب)  $\lim_{x \rightarrow 2^-} \frac{2x+8}{x+1} = \frac{9}{3} = 3$

ج)  $\lim_{x \rightarrow 2} \frac{2x+8}{x+1} = \frac{9}{3} = 3$

د)  $\lim_{x \rightarrow 0} \frac{2x+7}{[x^2]} = \frac{7}{0} \leftarrow \text{تعریف نشده}$

الف)  $\lim_{x \rightarrow 3} \varepsilon[x] - 2 = \varepsilon(3) - 2 = 4$

ب)  $\lim_{x \rightarrow 0^-} [\varepsilon x - 2] = \lim_{x \rightarrow 0^-} [10] = 9$

ج)  $\left[ \lim_{x \rightarrow 0^-} \varepsilon x - 2 \right] = [10] = 10$

د)  $\left[ \lim_{x \rightarrow 0^+} \varepsilon x - 2 \right] = [10] = 10$

الف)  $\lim_{x \rightarrow 4^-} \frac{3[x]+1}{2} = \frac{13}{2}$

ب)  $\lim_{x \rightarrow 4^-} \left[ \frac{3x+1}{2} \right] = [\Delta] = 6$

ج)  $\left[ \lim_{x \rightarrow 4^-} \frac{3x+1}{2} \right] = [\Delta] = \Delta$

د)  $\left[ \lim_{x \rightarrow 4^+} \frac{3x+1}{2} \right] = [\Delta] = \Delta$

الف)  $\lim_{x \rightarrow 1} \frac{x-8}{x^2-4x+8} \rightarrow \frac{(x-1)(x-8)}{1-4+8} \rightarrow \frac{1-8}{1-4+8} \rightarrow \frac{-7}{5}$

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الف)  $\lim_{x \rightarrow -3} [-3x] - [8x] \xrightarrow{-3^+} \text{مقدار } (-2, 9) : [8, 17] - [-14, 5] = 8+18 = 26$

ب)  $\lim_{x \rightarrow -3} [-3x] - [8x] \xrightarrow{-3^-} \text{مقدار } (-3, 1) : [9, 17] - [-18, 5] = 9+14 = 23$

ب)  $\lim_{x \rightarrow (-\frac{1}{2})^-} \left[ \frac{1}{x^2} \right] = [-14] = -14$

$x < -\frac{1}{2} \rightarrow \frac{1}{x} > -2 \rightarrow \frac{1}{x^2} > 4 \quad \frac{1}{x^2} < -14$



$$\text{الف) } \lim_{x \rightarrow 1} [\varepsilon x^3 - 3x^2 + 3] \xrightarrow{1^+} [\varepsilon^+ - 3 + 3] = [\varepsilon] = \varepsilon$$

$$\xrightarrow{1^-} [1^- - 3 + 3] = [1^-] = 1 \quad \left. \vphantom{\lim_{x \rightarrow 1}} \right\} \text{محدود}$$

$$\text{ب) } \lim_{x \rightarrow 0} [\varepsilon x^3 - 3x^2 + 3] \xrightarrow{0 \pm} [3] = 3$$

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$$\text{الف) } \lim_{x \rightarrow 2} \frac{|x^3 - 8|}{x^2 - 4} = \lim_{x \rightarrow 2} \frac{|x-2|(x^2 + 4x + 8)|x|}{(x-2)(x+2)} \xrightarrow{2^+} \frac{1}{3}$$

$$\xrightarrow{2^-} -\frac{1}{3} \quad \left. \vphantom{\lim_{x \rightarrow 2}} \right\} \text{محدود}$$

$$\text{ب) } \lim_{x \rightarrow \pi} \frac{|\sin x|}{\sin^2 x} = \lim_{x \rightarrow \pi} \frac{|\sin x|}{x^2 \sin x \cos x} \xrightarrow{\pi^+} \frac{1}{\pi^2}$$

$$\xrightarrow{\pi^-} -\frac{1}{\pi^2} \quad \left. \vphantom{\lim_{x \rightarrow \pi}} \right\} \text{محدود}$$

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$$\text{الف) } \lim_{x \rightarrow \frac{\pi}{2}} \sqrt{\cos x} \xrightarrow{\frac{\pi}{2}^+} \sqrt{0^+} = 0$$

$$\xrightarrow{\frac{\pi}{2}^-} \sqrt{0^-} = \text{غير معرف}$$

$$\text{ب) } \lim_{x \rightarrow 0} \sqrt{x - 2\sqrt{x}} \xrightarrow{0^+} \sqrt{0^+} = 0$$

$$\xrightarrow{0^-} \sqrt{x - 2\sqrt{0}} = \text{غير معرف}$$

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

$$\text{ب) } \lim_{x \rightarrow 2} \frac{x^2 - [x^2]}{x - [x]} \xrightarrow{2^+} \frac{x^2 - 4}{x - 2} = x + 2 = 4$$

$$\xrightarrow{2^-} \frac{x^2 - 3}{x - 1} = \frac{1}{1} = 1$$

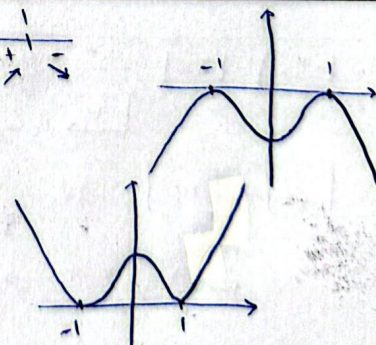
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$$\text{الف) } y = 3x^3 - 3x^2 + 2 \rightarrow y' = 9x^2 - 6x$$

$$= 3x^2(3 - 2x)$$

$$\text{ب) } y = x^3 - 2x^2 + 3 \rightarrow y' = 3x^2 - 4x$$

$$= x(3x - 4)$$



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