

$$\text{الف) } \lim_{x \rightarrow r^+} f(x) = d \quad (1)$$

$$\text{ب) } \lim_{x \rightarrow r^-} f(x) = d \quad (5)$$

$$\text{الف) } \lim_{x \rightarrow r^+} f(x) = f(r) = d \quad (2)$$

$$\text{ب) } \lim_{x \rightarrow r^-} f(x) = f(r) = 1 \quad (5)$$

$$\text{الف) } \lim_{x \rightarrow r^+} [f(x)] = [d^+] = d \quad (3)$$

$$\text{ب) } \lim_{x \rightarrow r^-} [f(x)] = [d^-] = d \quad (5)$$

$$\text{الف) } \left[ \lim_{x \rightarrow r^+} f(x) \right] = d \quad (4)$$

$$\text{ب) } \left[ \lim_{x \rightarrow r^-} f(x) \right] = d \quad (5)$$

ا)  $\lim_{x \rightarrow 0} \frac{f(x) - f(0)}{x - 0} = \frac{0}{0}$    
 $\begin{cases} x^+ \rightarrow +\infty \rightarrow \frac{9}{0^+} \\ x^- \rightarrow -\infty \rightarrow \frac{9}{0^-} \end{cases}$    
 (3)   
 جواب

ب)  $\lim_{x \rightarrow 0} \frac{f(x) - f(0)}{(x - 0)^2} = \frac{9}{(0^+)^2} = +\infty$    
 $\frac{9}{(0^-)^2} = +\infty$    
 $= +\infty$    
 (4)

ا)  $\lim_{x \rightarrow 0} \frac{f(x) - f(0)}{\sqrt{x - 0}}$    
 $\begin{cases} x^+ \rightarrow \frac{9}{\sqrt{0^+}} = \frac{9}{0^+} = +\infty \\ x^- \rightarrow \frac{9}{\sqrt{0^-}} = \text{ج.ب} \end{cases}$    
 جواب   
 (5)

ب)  $\lim_{x \rightarrow 0} \frac{f(x) - f(0)}{\sqrt{x^2 - f(x) + 0}}$    
 $\begin{cases} x^+ \rightarrow \frac{9}{\sqrt{0^+}} = +\infty \\ x^- \rightarrow \frac{9}{\sqrt{0^-}} = \text{ج.ب} \end{cases}$    
 جواب   
 (6)

ا)  $\lim_{x \rightarrow 0} \frac{f(x) - f(0)}{x^2 + \sqrt{x} + 0}$    
 $\begin{cases} x^+ \rightarrow \frac{9}{0^+} = -\infty \\ x^- \rightarrow \frac{9}{0^-} = +\infty \end{cases}$    
 جواب   
 (7)

ب)  $\lim_{x \rightarrow 0} \frac{f(x) - f(0)}{[x - 0]}$    
 $\begin{cases} x^+ \rightarrow \frac{9}{0} = \text{ج.ب} \\ x^- \rightarrow \frac{9}{0^-} = -9 \end{cases}$    
 جواب   
 (8)

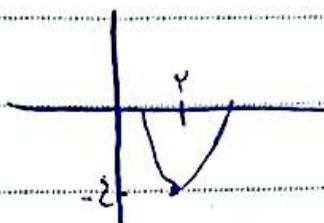
ا)  $\lim_{n \rightarrow \infty} [f(n)] - [-f(n)]$    
 $\begin{cases} n^+ \rightarrow 9 + (-0) = 9 \\ n^- \rightarrow 1 + (-0) = 1 \end{cases}$    
 (9)

ب)  $\lim_{n \rightarrow \infty} [-f(n)] + [f(n)]$    
 $\begin{cases} n^+ \rightarrow -9 + 0 = -9 \\ n^- \rightarrow -1 + 0 = -1 \end{cases}$    
 (10)

Arman

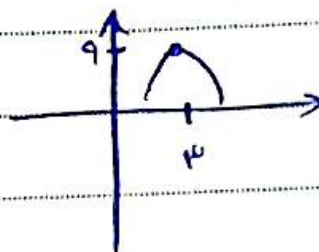
9

$$\text{a) } \lim_{x \rightarrow 2} [x^2 - 4x] \xrightarrow{\text{بسط}} \boxed{-4}$$



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



$$\text{c) } \lim_{x \rightarrow 2} \frac{|x-2|}{x^2 - 4x + 4} \begin{array}{l} \xrightarrow{x^+} \frac{x-2}{(x-1)(x-2)} = 1 \\ \xrightarrow{x^-} \frac{-(x-2)}{(x-1)(x-2)} = -1 \end{array} \rightarrow \text{ليس}$$

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$$\text{ب) } \lim_{x \rightarrow 1} \frac{x - [a]}{x^2 - 1} \begin{array}{l} \xrightarrow{1^+} \frac{1-1}{(1-1)(1+1)} = \frac{1}{2} \\ \xrightarrow{1^-} \frac{1-a}{(1-1)(1+1)} = \frac{1}{0^-} = -\infty \end{array} \rightarrow \text{ليس}$$