

<p>الف) ۵</p> <p>ب) ۵</p>	<p>فصل اول: توابع</p> <p>الف) $\lim_{x \rightarrow 2^+} (f(x) - 3) = f(2) - 3 = 5 - 3 = 2 \checkmark$</p> <p>ب) $\lim_{x \rightarrow 2^-} (f(x) - 3) = f(2) - 3 = 5 - 3 = 2 \checkmark$</p>	<p>(۲)</p> <p>۱</p>
---------------------------	---	---------------------

<p>الف) ۵</p>	<p>۱) ب</p> <p>الف) $x > 2 \rightarrow [x] \geq 2 \rightarrow \lim_{x \rightarrow 2^+} (f([x]) - 3) = f(2) - 3 = 5 - 3 = 2 \checkmark$</p> <p>ب) $x < 2 \rightarrow [x] < 2 \rightarrow \lim_{x \rightarrow 2^-} (f([x]) - 3) = f(1) - 3 = 1 - 3 = -2 \checkmark$</p>	<p>(۲)</p> <p>۲</p>
---------------	--	---------------------

<p>الف) ۵</p> <p>ب) ۴</p>	<p>$\lim_{x \rightarrow 2} (f(x) - 3) = 5 - 3 = 2 \checkmark$</p> <p>$\lim_{x \rightarrow 2} (f(1.999) - 3) = 4 - 3 = 1 \checkmark$</p>	<p>(۲)</p> <p>۳</p>
--------------------------------------	--	---------------------

<p>الف) ۵</p>	<p>$\lim_{x \rightarrow 2} (f(x) - 3) = 5 - 3 = 2 \checkmark$</p>	<p>(۲)</p> <p>۴</p>
---------------	--	---------------------

<p>الف) ۵</p> <p>ب) ۵</p>	<p>$\lim_{x \rightarrow 2} \frac{f(x) - 3}{x - 2} = \lim_{x \rightarrow 2^+} = +\infty$</p> <p>$\lim_{x \rightarrow 2} = -\infty$</p> <p>$\lim_{x \rightarrow 2} \frac{f(x) - 3}{(x - 2)^n} = +\infty$</p>	<p>(۲)</p> <p>۵</p>
--------------------------------------	---	---------------------

الف $\begin{matrix} \nearrow +\infty \\ \searrow -\infty \end{matrix}$ ✓

ب) $\lim_{x \rightarrow 2} \frac{f(x)-f(2)}{x-2}$

~~$f(2) > 0$~~

$\Rightarrow \begin{matrix} \nearrow +\infty \\ \searrow -\infty \end{matrix}$ ✓

الف)

$f'(2) < 0 \Rightarrow$

$\begin{matrix} \nearrow +\infty \\ \searrow -\infty \end{matrix}$ ✓

ب) $\begin{matrix} \nearrow +\infty \\ \searrow -9 \end{matrix}$ ✓

الف) $\begin{matrix} \nearrow 9 - 4 = 2 \\ \searrow 1 - 4 = -3 \end{matrix} \left. \vphantom{\begin{matrix} \nearrow 9 - 4 = 2 \\ \searrow 1 - 4 = -3 \end{matrix}} \right\} \lim_{x \rightarrow 2} \frac{[f(x)] + [-f(x)]}{f(2)}$ ✓

ب) $\begin{matrix} \nearrow 2^3 - 1^3 = 1 \\ \searrow 2^3 - 1^3 = 1 \end{matrix} \left. \vphantom{\begin{matrix} \nearrow 2^3 - 1^3 = 1 \\ \searrow 2^3 - 1^3 = 1 \end{matrix}} \right\} \lim_{x \rightarrow 2} \frac{[-f(x)] + [f(x)]}{f(2)} = 1$ ✓

الف) $\begin{pmatrix} -\infty \\ \text{min} \\ \infty \end{pmatrix}$ ✓

ب) $\begin{pmatrix} \infty \\ \text{max} \\ \infty \end{pmatrix}$ ✓

الف) $\begin{matrix} \nearrow \frac{1}{(x-1)} = 1 \\ \searrow \frac{1}{(x-1)} = -1 \end{matrix}$ ✓

ب) $\begin{matrix} \nearrow \frac{x+1}{x-1} = \frac{1}{x+1} \\ \searrow \frac{x}{x-1} = -\infty \end{matrix}$ ✓