

الف) $\lim_{x \rightarrow 2^+} f(x) - 3$ ب) $\lim_{x \rightarrow 2} f(x) - 3$

$\lim_{x \rightarrow 2^+} f(x) - 3 = f(2) - 3 = \infty$ $\lim_{x \rightarrow 2} f(x) - 3 = f(2) - 3 = \infty$

۵

الف) $\lim_{x \rightarrow 2^+} f[x] - 3$ $[2^+] = 2$ ب) $\lim_{x \rightarrow 2^-} f[x] - 3$ $[2^-] = 1$

$f(2) - 3 = \infty$ $f(1) - 3 = 1$

۵

الف) $\lim_{x \rightarrow 2^+} f[x - 3]$ $[1^+ - 3] = [\infty^+]$ ب) $\lim_{x \rightarrow 2^-} f[x - 3]$ $[1^- - 3] = [\infty^-]$

$\lim_{x \rightarrow 2^+} f[x - 3] = \infty$ $\lim_{x \rightarrow 2^-} f[x - 3] = f$

۵

الف) $\lim_{x \rightarrow 2^+} [f(x) - 3]$ ب) $\lim_{x \rightarrow 2^-} [f(x) - 3]$

$[f(2) - 3]_{[\infty^+]} = \infty$ $[f(2) - 3] = \infty$

۵

الف) $\lim_{x \rightarrow 2} \frac{f(x) - 3}{x - 2}$ ب) $\lim_{x \rightarrow 2} \frac{f(x) - 3}{(x - 2)^2}$

۵

الف) $\lim_{x \rightarrow 2} \frac{4x-4}{\sqrt{x}-2}$ $\Rightarrow \lim_{x \rightarrow 2} \frac{4x-4}{\sqrt{x^2-4x+4}} \quad \frac{1^+}{+1^+}$

$x^+ \rightarrow \frac{4}{\sqrt{0^+}} = +\infty$ $x^+ \rightarrow +\infty$

$x^- \rightarrow \frac{4}{\sqrt{0^-}} = -\infty$ $x^- \rightarrow -\infty$ *ليس*

5

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

$x^+ \rightarrow \frac{4}{0^+} = +\infty$ $x^+ \rightarrow \infty$

$x^- \rightarrow \frac{4}{0^-} = -\infty$ $x^- \rightarrow -\infty$ *ليس*

ب) $\lim_{x \rightarrow 2} \frac{4x-4}{[x-2]}$

$x^+ \rightarrow \infty$

$x^- \rightarrow -4x+4 = -4(2)+4 = -8+4 = -4$

1,0

الف) $\lim_{x \rightarrow 2} [4x] + [-4x]$ $\Rightarrow \lim_{x \rightarrow 2} [-4x] + [4x]$

$x^+ \rightarrow 4 + (-4) = 0$

$x^- \rightarrow 4 + (-4) = 0$

$x^+ \rightarrow 4 + (-4) = 0$

$x^- \rightarrow 4 + (-4) = 0$

5

الف) $\lim_{x \rightarrow 2} [x^2 - 4x]$ $\Rightarrow \lim_{x \rightarrow 2} [4x - x^2]$

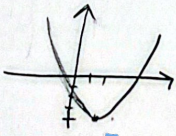
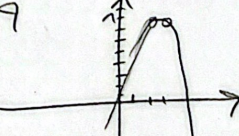
$x^+ \rightarrow [4^+ - 16^+] = -12$

$x^- \rightarrow [4^- - 16^-] = -12$

$x^+ \rightarrow [16^+ - 4^+] = 12$

$x^- \rightarrow [16^- - 4^-] = 12$

لن [4] = 1

9

الف) $\lim_{x \rightarrow 2} \frac{(x-2)}{x^2-4x+4} = \frac{0}{0}$

$x^+ \rightarrow \frac{(x-2)}{(x-2)(x-2)} = \frac{1}{(x-2)} = \frac{1}{1} = 1$

$x^- \rightarrow \frac{-(x-2)}{(x-2)(x-2)} = \frac{-1}{(x-2)} = \frac{-1}{1} = -1$

ب) $\lim_{x \rightarrow 1} \frac{x-[x]}{x^2-1}$

$x^+ \rightarrow \frac{x-1}{(x+1)(x-1)} = \frac{1}{x+1} = \frac{1}{2}$

$x^- \rightarrow \frac{x-0}{x^2-1} = \frac{1}{x^2-1} = \frac{1}{0^-} = -\infty$

5