

$$\text{الف) } \lim_{x \rightarrow 1} \frac{x-2}{(x-2)(x-1)} = \frac{1}{x+1}$$

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

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

$$\text{ب) } \lim_{x \rightarrow 3} \frac{x-5}{(x-3)^2} \rightarrow x \rightarrow 3^+ = \frac{-1}{0^+} = -\infty$$

$$\rightarrow x \rightarrow 3^- = \frac{-1}{0^-} = +\infty$$

$$\text{الف) } \lim_{x \rightarrow -1} [-x^3] - [\omega x] \rightarrow 1 - (-1\omega) = 2\omega$$

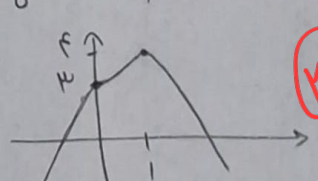
$$\lim_{x \rightarrow (-1)^-} \left[\frac{-1}{x^2} \right] = -14$$

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

$$\text{ب) } \lim_{x \rightarrow -1} \left[\frac{-1}{x^2} \right] \rightarrow x < -\frac{1}{14} \rightarrow x^2 > \frac{1}{14} \rightarrow -x^2 < -\frac{1}{14}$$

$$\Rightarrow [-14^-] \cup [-14^+] = -\frac{1}{x^2} > -14$$

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

$$y' = -12x^3 + 12x^2 \rightarrow 12x^2(1-x)$$


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

$$\rightarrow x \rightarrow 0^+ = [3]$$

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

$$= \frac{3+3+3}{0} = \infty$$

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

$$\text{الف) } \lim_{x \rightarrow 1} \frac{x+2}{x+1} = \frac{3}{2} = \frac{9}{6} = \frac{3}{2}$$

$$\text{ب) } \lim_{x \rightarrow 2} \frac{x+2}{x+1} = \frac{4}{3} = \frac{9}{6} = \frac{3}{2}$$

$$\text{ج) } \lim_{x \rightarrow 2} \frac{x+2}{x+1} = \frac{4}{3} = \frac{9}{6} = \frac{3}{2}$$

$$\text{د) } \lim_{x \rightarrow 2} \frac{x+2}{x+1} = \frac{4}{3} = \frac{9}{6} = \frac{3}{2}$$

$$\text{ه) } \lim_{x \rightarrow 0} \frac{x^2 + 1}{x^2} \rightarrow \frac{1}{0^+} = \infty$$

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

$$\text{الف) } \lim_{x \rightarrow 2} \varepsilon[x] - 2 \rightarrow f(2) - 2 = 9$$

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

$$\text{ج) } \lim_{x \rightarrow 2} [\varepsilon x - 2] = [10] = 10$$

$$\text{د) } \lim_{x \rightarrow 2} [\varepsilon x - 2] = [10] = 10$$

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

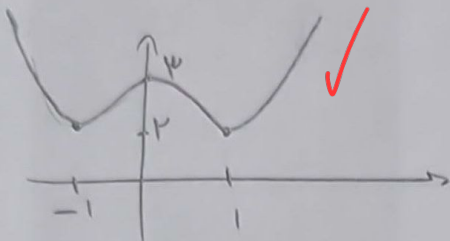
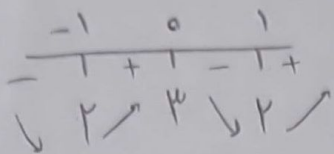
$$\text{ب) } \lim_{x \rightarrow 2} \left[\frac{x^3 + 1}{x} \right] = [5] = 5$$

$$\text{ج) } \lim_{x \rightarrow 2} \left[\frac{x^3 + 1}{x} \right] = [5] = 5$$

$$\text{د) } \lim_{x \rightarrow 2} \left[\frac{x^3 + 1}{x} \right] = [5] = 5$$

ب) $y = x^5 - 2x^2 + 3$

$y' = 5x^4 - 4x \rightarrow 5x(x^3 - 1)$



ب) $\lim_{x \rightarrow \infty} \frac{\ln x}{x} = \frac{\infty}{\infty} \rightarrow \frac{-\infty}{\infty} = -\frac{1}{\infty} = 0$

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

ب) $\lim_{x \rightarrow \frac{\pi}{2}^-} \sqrt{\cos x} = \sqrt{\cos \frac{\pi}{2}^-} = \sqrt{0^-} = 0$

$\lim_{x \rightarrow 0} \sqrt{x - 2\sqrt{x}} = \text{تعريف}$

ب) $\lim_{x \rightarrow 0} \sqrt{x - 2\sqrt{x}} = \sqrt{0 - 2\sqrt{0}} = 0$

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الف) $\lim_{x \rightarrow 0^+} \frac{(-1)^{\lfloor x \rfloor}}{x^3 - x^2} = \frac{(-1)^0}{0^3 - 0^2} = \frac{1}{0} = \infty$

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

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

الف) $y = -3x^5 + 5x^3 + 2$

$y' = -15x^4 + 15x^2 \rightarrow 15x^2(1 - x^2)$

