

$$\lim_{x \rightarrow 2^-} \frac{x^2 + 1}{x + 1} = \frac{5}{3}$$

$$\lim_{x \rightarrow 2^+} \frac{x^2 + 1}{x + 1} = \frac{5}{3}$$

$$\lim_{x \rightarrow 0} \frac{x^2 + 1}{[x]^2} = \frac{1}{0} = \infty$$

$$\lim_{x \rightarrow 2} \frac{x^2 + 1}{x + 1} = \frac{5}{3}$$

$$\lim_{x \rightarrow 2^-} [x^2 - 2] = \lim_{x \rightarrow 2^-} [10^-] = 9$$

$$\lim_{x \rightarrow 2^-} f[x] - 2 = 9$$

$$[\lim_{x \rightarrow 2^+} x^2 - 2] = 10$$

$$[\lim_{x \rightarrow 2^-} x^2 - 2] = [10] = 10$$

$$\lim_{x \rightarrow 2^-} \left[\frac{x^2 + 1}{x} \right] = \lim_{x \rightarrow 2^-} [5] = 5$$

$$\lim_{x \rightarrow 2^-} \frac{x^2 + 1}{x} = \lim_{x \rightarrow 2^-} \frac{5}{2} = \frac{5}{2}$$

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

$$\left[\lim_{x \rightarrow 2^-} \frac{x^2 + 1}{x} \right] = [5] = 5$$

$$\lim_{x \rightarrow 2} \frac{x - 5}{x^2 - 5x + 9} = \lim_{x \rightarrow 2} \frac{x - 5}{(x - 2)^2}$$

$$\lim_{x \rightarrow 1} \frac{x - 1}{x^2 - 5x + 4} = \frac{0}{0}$$

$$\lim_{x \rightarrow 1} \frac{x - 1}{(x - 1)(x - 4)} = \lim_{x \rightarrow 1} \frac{1}{x - 4} = \frac{1}{-3} = -\frac{1}{3}$$

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

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

$$\lim_{x \rightarrow (-\frac{1}{2})^-} \left[\frac{-1}{x^2} \right] = \lim_{x \rightarrow (-\frac{1}{2})^-} \left[\frac{-1}{(\frac{1}{4})^-} \right] = [-16^-] = -16$$

$$\lim_{x \rightarrow -2} [-x^2] = [-4]$$

$$\lim_{x \rightarrow -2^+} [x^2] = 4$$

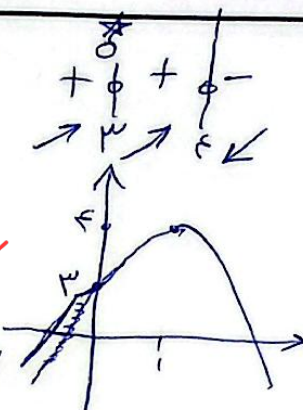
$$\lim_{x \rightarrow -2^-} [x^2] = 4$$

$$\lim_{x \rightarrow -2} \left[\frac{1}{x^2} \right] = \frac{1}{4}$$

$$y = \varepsilon x^3 - 3x^2 + 3 \xrightarrow{\text{مشتق}} y' = 3x^2 - 6x = 3x^2(1-x)$$

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

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



$\lim_{x \rightarrow 2} \frac{|x^3 - 1|}{x^2 - 5}$
 $\lim_{x \rightarrow 2^+} \frac{(x^3 - 1)}{x^2 - 5} = \lim_{x \rightarrow 2^+} \frac{(x-1)(x^2 + x + 1)}{(x+1)(x-1)} = \frac{12}{8} = \frac{3}{2} \checkmark$ (الف)

$\lim_{x \rightarrow \pi} \frac{|\sin x|}{\sin x} = \lim_{x \rightarrow \pi} \frac{1 - x^2}{x^2 - 5} = \lim_{x \rightarrow \pi} \frac{(1-x)(1+x)}{(x-1)(x+1)} = \frac{-12}{8} = -\frac{3}{2} \checkmark$

$\lim_{x \rightarrow \pi^+} \frac{-\sin x}{1 - \sin x \cos x} = \frac{-1}{1 - 0} = -1 \checkmark$
 $\lim_{x \rightarrow \pi^-} \frac{\sin x}{-1 - \sin x \cos x} = \frac{-1}{-1 - 0} = 1 \checkmark$

$\lim_{x \rightarrow 0} \sqrt{x - 2\sqrt{x}}$
 $\lim_{x \rightarrow 0^+} \sqrt{x - 2\sqrt{x}} = \lim_{x \rightarrow 0^+} \sqrt{x} = \lim_{x \rightarrow 0^+} \sqrt{x} = 0$
 $\lim_{x \rightarrow 0^-} \sqrt{x - 2\sqrt{x}} = \text{غير معرف}$

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

$\lim_{x \rightarrow 2} \frac{x^2 - [x]}{x - [x]}$
 $\lim_{x \rightarrow 2^+} \frac{x^2 - 2}{x - 2} = \lim_{x \rightarrow 2^+} \frac{(x-2)(x+2)}{x-2} = 4 \checkmark$
 $\lim_{x \rightarrow 2^-} \frac{x^2 - 1}{x - 1} = \frac{3}{1} = 3 \checkmark$
 $\lim_{x \rightarrow 2^-} \frac{x^2 - 3}{x - 1} = \frac{\varepsilon - 3}{1 - 1} = 1 \checkmark$

$\lim_{x \rightarrow 0^+} \frac{(-1)^{[\sin x]}}{x^2 - x^2} = \text{الف 9}$
 $\lim_{x \rightarrow 0^+} \frac{-1^0}{x^2(x^2 - 1)} = \lim_{x \rightarrow 0^+} \frac{1}{x^2(x^2 - 1)} = -\infty \checkmark$

