

نوع 2 -

نوع 3

نوع 1

$$1) \lim_{x \rightarrow \infty} \frac{x+0}{x+1} = \frac{\infty}{\infty} = 1 \quad \lim_{x \rightarrow -\infty} \frac{x+0}{x+1} = \frac{\infty}{\infty} = 1$$

$$2) \lim_{x \rightarrow \infty} \frac{x+0}{x+1} = \infty \quad 3) \lim_{x \rightarrow 0} \frac{x+0}{[x^2]} \rightarrow \frac{0}{0} \rightarrow \text{فرض } x = \frac{1}{n} \rightarrow \lim_{n \rightarrow \infty} \frac{1/n}{1/n^2} = \lim_{n \rightarrow \infty} n = \infty$$

$$1) \lim_{x \rightarrow \infty} [x] = \infty \quad 2) \lim_{x \rightarrow \infty} [x-1] = \infty \quad 3) \lim_{x \rightarrow \infty} [x] = \infty$$

$$2) \lim_{x \rightarrow \infty} [x-1] = \infty \quad 3) \lim_{x \rightarrow \infty} [x] = \infty$$

$$4) \lim_{x \rightarrow \infty} \frac{x+1}{x} = \frac{\infty}{\infty} = 1 \quad 5) \lim_{x \rightarrow \infty} \left[\frac{x+1}{x} \right] = \left[\frac{\infty}{\infty} \right] = \left[1 \right] = 1$$

$$3) \lim_{x \rightarrow \infty} \left[\frac{x+1}{x} \right] = 1 \quad 4) \lim_{x \rightarrow \infty} \left[\frac{x+1}{x} \right] = 1$$

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

$$3) \lim_{x \rightarrow \infty} \frac{x-1}{x^2-1} = \frac{\infty}{\infty} = \frac{1}{x} = 0 \quad 4) \lim_{x \rightarrow \infty} \frac{x-1}{x^2-1} = \frac{\infty}{\infty} = \frac{1}{x} = 0$$

$$1) \lim_{x \rightarrow \infty} [-x] = -\infty \quad 2) \lim_{x \rightarrow \infty} [-x] = -\infty$$

$$3) \lim_{x \rightarrow \infty} \left[\frac{-1}{x^2} \right] = \left[\frac{-1}{\infty} \right] = \left[0 \right] = 0 \quad 4) \lim_{x \rightarrow \infty} \left[\frac{-1}{x^2} \right] = \left[\frac{-1}{\infty} \right] = \left[0 \right] = 0$$

4- ا) $\lim_{n \rightarrow 1} [x^n - nx^{\frac{1}{n}} + n]$ $\rightarrow n \rightarrow 1^+ \rightarrow [m^{\frac{1}{n}}]_{n, \frac{1}{n}}$ ✓
 $\rightarrow n \rightarrow 1^- \rightarrow [x^{\frac{1}{n}}]_{n, \frac{1}{n}}$

جواب این سلف

ب) $\lim_{n \rightarrow 0} [x^n - nx^{\frac{1}{n}} + n]$ $\rightarrow n \rightarrow 0^+ \rightarrow [n]_{n, \frac{1}{n}}$
 $\rightarrow n \rightarrow 0^- \rightarrow [n]_{n, \frac{1}{n}}$

5- ا) $\lim_{n \rightarrow 2} \frac{n^2 - 1}{n^2 - 8}$ $\rightarrow n \rightarrow 2^+ \rightarrow \frac{1}{x} \rightarrow \frac{1}{2}$ ✓
 $\rightarrow n \rightarrow 2^- \rightarrow \frac{1}{x} \rightarrow \frac{1}{2}$

ب) $\lim_{n \rightarrow 2} \frac{|\sin n|}{\sin n}$ $\rightarrow n \rightarrow 2^+ \rightarrow \frac{-\sin n}{\sin n} = \frac{-1}{1} = -1$ ✓
 $\rightarrow n \rightarrow 2^- \rightarrow \frac{\sin n}{\sin n} = \frac{1}{1} = 1$

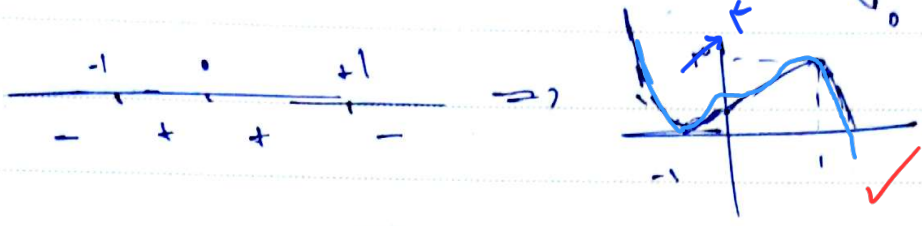
6- ا) $\lim_{n \rightarrow \frac{\pi}{2}} \sqrt{\cos n}$ $\rightarrow n \rightarrow \frac{\pi}{2}^+ \rightarrow \sqrt{0^+} = 0$ ✓
 $\rightarrow n \rightarrow \frac{\pi}{2}^- \rightarrow \sqrt{0^-} = 0$

ب) $\lim_{n \rightarrow 0} \sqrt{n-1} \sqrt{n}$ $\rightarrow n \rightarrow 0^+ \rightarrow \sqrt{n-1} \sqrt{n} \rightarrow 0$ ✓
 $\rightarrow n \rightarrow 0^- \rightarrow \sqrt{n-1} \sqrt{n} \rightarrow 0$

7- ا) $\lim_{n \rightarrow 0} \frac{(-1)^{[5 \ln n]}}{n^2(n-1)}$ $\rightarrow \frac{(-1)^0}{0^-} = \frac{1}{0^-} = \infty$ ✓
 $\rightarrow \frac{1}{0^-} = \infty$

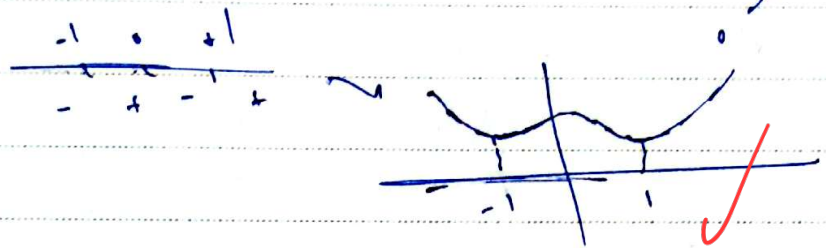
ب) $\lim_{n \rightarrow 2} \frac{n^2 - [n^2]}{n - [n]}$ $\rightarrow n \rightarrow 2^+ \rightarrow \frac{(n-1)(n+1)}{n-2} \rightarrow \frac{1}{0^-} = \infty$ ✓
 $\rightarrow n \rightarrow 2^- \rightarrow \frac{n^2 - 4}{n-2} = \frac{n-2}{n-2} = 1$

21) $\lim_{x \rightarrow 0^+} \ln x + \frac{1}{x} \rightarrow \infty$, $\lim_{x \rightarrow 0^-} \ln x - \frac{1}{x} \rightarrow \infty$, $\lim_{x \rightarrow 1} \ln x (1-x) = 0$ ± 1



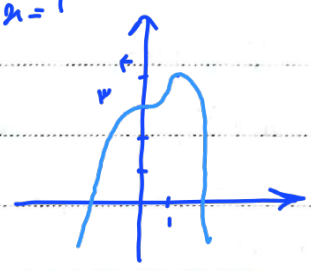
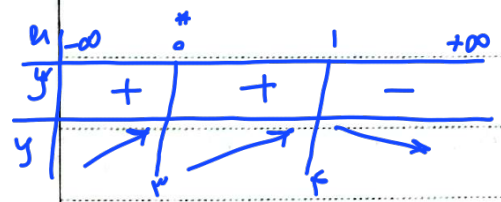
✓

22) $\lim_{x \rightarrow 0^+} \ln x + \frac{1}{x} \rightarrow \infty$, $\lim_{x \rightarrow 0^-} \ln x - \frac{1}{x} \rightarrow \infty$, $\lim_{x \rightarrow 1} \ln x (1-x) = 0$ ± 1



$y = \ln x - \frac{1}{x} + \frac{1}{x} \rightarrow y' = \ln x - \frac{1}{x} \xrightarrow{y'=0} \ln x (1-x) = 0 \rightarrow \begin{cases} x=0 \\ x=1 \end{cases}$

سوال 4



23) $\lim_{x \rightarrow 0} [\ln x - \frac{1}{x} + \frac{1}{x}] = \begin{cases} \lim_{x \rightarrow 0^+} [\ln x - \frac{1}{x} + \frac{1}{x}] = \ln 0 \\ \lim_{x \rightarrow 0^-} [\ln x - \frac{1}{x} + \frac{1}{x}] = \ln 0 \end{cases}$