

کوچکتر از صفر

آرٹالابی کیا - رکبیا ۲۰

$$1) \lim_{n \rightarrow 2} 2n - 2 = 1 \quad \lim_{n \rightarrow 2} n^2, a, n, b > 0 \Rightarrow \Delta \varepsilon = (n-2)^2 > 0 \Rightarrow a = 4, b = 4 \quad \left. \begin{array}{l} a = 4 \\ b = 4 \end{array} \right\} a + b = 8$$

$$2) \lim_{n \rightarrow \sqrt[3]{4}} n = \sqrt[3]{4} > 0 \Rightarrow \lim_{n \rightarrow \sqrt[3]{4}} n^2, a, n, b > 0 \Rightarrow (n - \sqrt[3]{4})^2 = n^2 - 2\sqrt[3]{4}n + \sqrt[3]{16}$$

$$b = \sqrt[3]{16} \quad a = -2\sqrt[3]{4} \Rightarrow \frac{b}{a} = \frac{\sqrt[3]{16}}{-2\sqrt[3]{4}} \Rightarrow \left[\frac{b}{a}\right] = -1$$

$$3) \lim_{n \rightarrow (\frac{1}{\sqrt{3}})^+} [-n] + a = -1 + a \quad \lim_{n \rightarrow (\frac{1}{\sqrt{3}})^+} \left| \frac{\sqrt{3}}{n} \left(\frac{1}{\sqrt{3}} \right) + a \right| + a$$

اگر داخل در صلت منفی باشد a و $a - a$ خواهند شد و دیگر جواب حد ∞ نمی شود پس:

$$\frac{1}{\sqrt{3}} + a > 0 \Rightarrow \frac{1}{\sqrt{3}} + 2a = 0 \Rightarrow a = -\frac{1}{2\sqrt{3}} \Rightarrow [a] = -1$$

$$4) n > -\frac{1}{\sqrt{3}} \Rightarrow n^2 < \frac{1}{\varepsilon} \Rightarrow \frac{1}{n^2} > \varepsilon \quad \begin{array}{l} \frac{-2}{n^2} < -\varepsilon \\ \frac{2}{n^2} > \varepsilon \end{array} \Rightarrow \frac{14(-\frac{1}{\sqrt{3}}) - (-9)}{2\varepsilon(-\frac{1}{\sqrt{3}}) + 12} = \frac{1}{\varepsilon} \Rightarrow +\infty$$

$$5) \lim_{n \rightarrow 2^+} n^2 - [n^2] = n^2 - n \quad \lim_{n \rightarrow 2^+} n^2 - \varepsilon \Rightarrow \frac{(n-2)(n+2)}{(n-2)(n^2 + 2n - 4)} = \frac{1}{12} = \frac{1}{12}$$

$$6) \lim_{n \rightarrow -\infty} \frac{(n+1)(n+2)}{4(2+\sqrt{n})} = \frac{(\sqrt[3]{4}+2)(\sqrt[3]{4}+2)(\sqrt[3]{4}+2)(n+2)}{4(\sqrt[3]{4}+2)} \Rightarrow \lim_{n \rightarrow -\infty} \frac{(4+4+4)(-9)}{4} = -12$$

$$7) \lim_{n \rightarrow 0^-} \frac{\sqrt{2+2n} - \sqrt{2-n}}{\sqrt{1-\cos n}} \xrightarrow{\text{نزدیک}} \frac{2+2n - (2-n)}{(\sqrt{2+2n} + \sqrt{2-n})(\sqrt{1-\cos n})} = \lim_{n \rightarrow 0^-} \frac{3n}{2\sqrt{2}\sqrt{1-\cos n}}$$

$$\cos n \sim 1 - \frac{n^2}{2} \Rightarrow \sqrt{1-\cos n} = \sqrt{1 - (1 - \frac{n^2}{2})} = \sqrt{\frac{n^2}{2}} \Rightarrow \frac{3n\sqrt{2}}{2\sqrt{2}\sqrt{n^2}} = \lim_{n \rightarrow 0^-} \frac{3n}{|n|} = -3$$

$$8) \cos u \sim 1 - \frac{u^2}{2} \Rightarrow \lim_{u \rightarrow 0} \frac{u + (1 - \frac{(\sqrt{au})^2}{2})}{u\sqrt{u}} = \frac{u + (1 - \frac{au}{2})}{u\sqrt{u}} = \frac{1}{\sqrt{u}} \xrightarrow{u \rightarrow 0} +\infty$$

در نظر بگیرید تا بتوانیم

u^2 صورت و مخرج (وسا) کنیم.

$$\lim_{u \rightarrow 0} \frac{-1 + 1 - \frac{au^2}{2}}{-u^2} = \frac{a}{2} \Rightarrow a = 4 \quad \frac{a}{u} = 4$$

$$9) \lim_{u \rightarrow \sqrt{a}^+} \frac{r\sqrt{u-\sqrt{a}} + r\sqrt{u} - r\sqrt{a}}{\sqrt{u-\sqrt{a}} \cdot \sqrt{u+\sqrt{a}}} \stackrel{\text{لیم}}{=} \frac{r\sqrt{u-\sqrt{a}} + r(\sqrt{u} - \sqrt{a})}{\sqrt{u-\sqrt{a}} \cdot \sqrt{u+\sqrt{a}}} \xrightarrow{\text{مضروب}}$$

$$\lim_{u \rightarrow \sqrt{a}} \frac{(r\sqrt{u-\sqrt{a}} \times \sqrt{u} + \sqrt{a}) - r(u-\sqrt{a})}{(\sqrt{u-\sqrt{a}})(\sqrt{u+\sqrt{a}})(\sqrt{u} + \sqrt{a})} \stackrel{\text{لیم}}{=} \frac{\cancel{\sqrt{u-\sqrt{a}}} (r\sqrt{u} + r\sqrt{a} + r\sqrt{u-\sqrt{a}})}{\cancel{\sqrt{u-\sqrt{a}}} \sqrt{u+\sqrt{a}} \sqrt{u} + \sqrt{a}}$$

$$\lim_{u \rightarrow \sqrt{a}^+} \frac{r\sqrt{a} - r(0)}{\sqrt{a} \times r\sqrt{a}} = \lim_{u \rightarrow \sqrt{a}^+} \frac{r\sqrt{a}}{\sqrt{a} \times r\sqrt{a}} = \frac{r}{\sqrt{a}}$$

$$10) \lim_{u \rightarrow -1^-} \frac{1+u}{0^-} = -\infty \Rightarrow 1+u > 0 \Rightarrow u > -1$$

$$\lim_{u \rightarrow -1^+} \frac{1+2u}{0^+} = -\infty \Rightarrow 1+2u < 0 \Rightarrow u < -\frac{1}{2}$$

$$\left. \begin{array}{l} -1 < u < -\frac{1}{2} \\ -\pi < u\pi < -\frac{\pi}{2} \end{array} \right\} \Rightarrow -1 < \cos \pi < 0$$

ناممکن