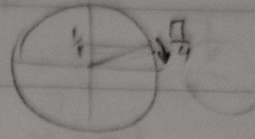


$$\begin{aligned} x = -r^+ &\rightarrow r(1) + a(0) = r \quad \begin{cases} r = r - a \rightarrow a = r \\ \left[\frac{a}{r}\right] = \left[\frac{r}{r}\right] = 0 \end{cases} \\ x = -r^- &\rightarrow r(r) + a(-1) = r - a \end{aligned}$$

$$\lim_{x \rightarrow \frac{\pi}{4}^-} [r \sin x - 1] = [0^-] = -1$$



$$\lim_{n \rightarrow \frac{1}{r}} [1 \wedge x^n - n] = \left[1 \left(\frac{1}{\wedge}\right) + \frac{1}{r}\right] = -1 + \left[\frac{1}{r}\right] = -1$$

$$\lim_{x \rightarrow \frac{1}{r}} \frac{10x - 2 + 11}{14x + 1} \rightarrow \frac{1}{0^-} = -\infty$$

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

$$= 1 - \cos \pi = 2$$

$$\lim_{x \rightarrow -1} \frac{\sqrt{2x+3} - \sqrt{3x+4}}{1 + \sqrt{x}} = \frac{0}{0} \xrightarrow{\text{Hop}} \frac{\frac{1}{\sqrt{2x+3}} - \frac{1}{\sqrt{3x+4}}}{\frac{1}{2\sqrt{x}}} = \frac{1 - \frac{\sqrt{3x+4}}{\sqrt{2x+3}}}{\frac{1}{\sqrt{x}}}$$

$$= \frac{-\frac{1}{\sqrt{3}}}{+\frac{1}{\sqrt{2}}} = -1 \quad \frac{1 - \frac{\sqrt{3}}{\sqrt{2}}}{+\frac{1}{\sqrt{2}}} = \frac{-\frac{1}{\sqrt{2}}}{\frac{1}{\sqrt{2}}} = -1$$

$$\lim_{n \rightarrow 1} \frac{2n - \sqrt{2n} + 0}{2n - \sqrt{2n} + 1} = \frac{0}{0} \xrightarrow{\text{Hop}} \frac{2 - \frac{\sqrt{2}}{\sqrt{2n}}}{2 - \frac{\sqrt{2}}{\sqrt{2n} + 1}} = \frac{2 - \frac{\sqrt{2}}{\sqrt{2}}}{2 - \frac{\sqrt{2}}{2}}$$

$$= \frac{-\frac{\sqrt{2}}{2}}{\frac{2}{2}} = -1$$

1- خارج مفروضه حد را عددی $\frac{0}{0}$ و رفع ابهام

$$\xrightarrow{\text{Hop}} \frac{b}{r\sqrt{bx+c}} = \frac{b}{x\sqrt{c}} = \frac{1}{r} \rightarrow b=1, c=r$$

$$a + \sqrt{x + r} = 0 \xrightarrow{x \rightarrow 0} a = -r \Rightarrow \frac{ab}{c} = \frac{(-r)(1)}{r} = -\frac{1}{r}$$

$$\xrightarrow{-\infty^+} \frac{f + k(-r)}{0^+} \xrightarrow{+\infty} f - rk > 0 \rightarrow k < r \quad \left. \vphantom{\frac{f + k(-r)}{0^+}} \right\} [-k] = -r \quad -4$$

$$\xrightarrow{-\infty^-} \frac{f + k(-r)}{0^-} \xrightarrow{+\infty} f - rk < 0 \rightarrow k > \frac{f}{r} \quad \checkmark \quad \text{و}$$

$$\frac{rb - rb}{ra - b} \Rightarrow ra = b$$

۱۰ صورت ضرب و برای عدد صحیح

$$\xrightarrow{\text{همچون}} \frac{\frac{b}{r\sqrt{r+x}} \times \frac{1}{r\sqrt{2r}}}{a} = \frac{\frac{b}{r\sqrt{2r}}}{\frac{b}{r}} = \frac{1}{r\sqrt{2}}$$

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صورت کمر به صفر می‌رکند پس چون جواب حد عددی حقیقی است مخرج هم باید به صفر می‌رکند!

$$a-b \neq 0 \rightarrow b \neq a$$

$$\lim_{n \rightarrow \infty} \frac{a(\sqrt{2+\sqrt{n}} - 2)}{a(n-1)} \times \frac{\sqrt{2+\sqrt{n}} + 2}{\sqrt{2+\sqrt{n}} + 2} = \lim_{n \rightarrow \infty} \frac{a(\sqrt{n} - 2)}{a(n-1) \times 4}$$

$$= \lim_{n \rightarrow \infty} \frac{1}{(\sqrt{n^2} + \sqrt{n^2+2}) \times 4} = \frac{1}{12 \times 4} = \frac{1}{48}$$