

$$\lim_{n \rightarrow 1} \frac{5n^2 - 7n + 12}{5n^2 - 11n + 12} \xrightarrow{\text{h\ddot{o}p}} \frac{10n - 7}{10n - 11} = \left[\frac{1}{2} \right]$$

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نوع اول

$$\lim_{n \rightarrow 0} \frac{|5n-1| - |5n+1|}{n} \rightarrow \frac{-5n+1 - (5n+1)}{n} = \frac{-10n}{n} = -10$$

$\left. \begin{array}{l} 5n-1 < 0 \\ 5n+1 > 0 \end{array} \right\}$
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نوع اول

$$\lim_{n \rightarrow 4} \frac{n-4}{\sqrt{n}-2} \rightarrow \frac{(\sqrt{n}-2)(\sqrt{n}+2)}{\sqrt{n}-2} = \left[4 \right]$$

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نوع اول

$$\lim_{n \rightarrow 4} \frac{n - \sqrt{4n}}{5n^2 - n - 4} \xrightarrow{\text{h\ddot{o}p}} \frac{1 - \frac{1 \times 2}{2\sqrt{4n}}}{10n - 1} \rightarrow \frac{1 - \frac{1}{4}}{40} = \frac{\frac{3}{4}}{40} = \left[\frac{3}{160} \right]$$

$$\lim_{n \rightarrow 1} \frac{1 - \sqrt{n}}{4 - \sqrt{5-n}} \xrightarrow{\text{h\ddot{o}p}} \frac{+\left(\frac{1}{2\sqrt{n}}\right)}{+\left(\frac{1 \times -1}{2\sqrt{5-n}}\right)} = \frac{\frac{1}{2}}{\frac{-1}{2}} = \left[-1 \right]$$

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

$$\Rightarrow \frac{1 \times 1}{1 \times 1} = \frac{1}{1}$$

$$\lim_{n \rightarrow 1} \frac{\sqrt{n+1} - 1}{\sqrt{n} - 1} \cdot \frac{1}{1} = \frac{n+1-1}{n-1} \times \frac{1}{1} = \frac{n}{n-1} \times \frac{1}{1} \Rightarrow$$

$$\left(1 + \frac{1}{n-1}\right) \times \frac{1}{1} = \left(1 + \frac{1}{(n-1)(n+1)}\right) \times \frac{1}{1} = \frac{1}{1} \times \frac{1}{1} = \frac{1}{1}$$

$$\lim_{n \rightarrow \infty} \frac{1 + \cos^n}{\sin^n} \xrightarrow{\text{hop}} \frac{(1 + \cos^n)(1 - \cos^n + \cos^{2n})}{(1 - \cos^n)} = \frac{(1 + \cos^n)(1 - \cos^n + \cos^{2n})}{(1 - \cos^n)(1 + \cos^n)}$$

$$\Rightarrow \frac{1 - (-1) + (-1)^2}{1 - (-1)} = \frac{2}{2}$$

$$\lim_{n \rightarrow \frac{\pi}{2}} \frac{1 - \tan^n}{\sin^n - \cos^n} \xrightarrow{\text{hop}} \frac{-(1 + \tan^n)}{\cos^n + \sin^n} = \frac{-2}{\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}}} = \frac{-2}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{-2\sqrt{2}}{\sqrt{2}} = -\sqrt{2}$$

$$\lim_{n \rightarrow \frac{\pi}{2}} \frac{\tan^n - 1}{\cos^n} \xrightarrow{\text{hop}} \frac{1 \tan^n (1 + \tan^n)}{-(1 \sin^n)} = \frac{1-1(1+1)}{-(-1)} = \frac{-2}{1} = -2$$