```
\underset{\sum_{n=1}^{\infty}}{n^{th}} a_n
           \lim_{n \to \infty} a_n =
  \begin{cases} a_n \\ a_n \end{cases}
\lim_{n \to \infty} 1/n =
\begin{array}{l} \lim_{n \to \infty} \frac{1}{n} - 0 \\ 0 \\ \sum_{n=1}^{\infty} \frac{1}{n} \\ \{1/n\} \end{array} Ratio Test \begin{array}{l} testRatioTestLet\{_n\} \\ \lim_{n \to \infty} \frac{a_{n+1}}{a_n} = 1 \end{array}

\begin{array}{c}
\lim_{n \to \infty} \frac{1}{2} \\
L < 1 \\
L < 1
\end{array}

\begin{array}{c}
\sum_{n=1}^{\infty} a_n \\
L > 1
\end{array}

\begin{array}{c}
L = \sum_{n=1}^{\infty} a_n \\
L = 1
\end{array}

        \lim_{n \to \infty} \frac{a_{n+1}}{a_n} =
        L < n
\{a_n\}
   \{a_n\} \\ {}_{ratio1} Applying the RatioTestU sethe RatioTest to determine the convergence of the following series: } \\ 1. \sum_{n=1}^{\infty} \frac{2^n}{n!} 2. \sum_{n=1}^{\infty} \frac{3^n}{n^3} 3. \sum_{n=1}^{\infty} \frac{1}{n^2+1}. \\ \sum_{n=1}^{\infty} \frac{2^n}{n!} \\ \lim_{n \to \infty} \frac{2^{n+1}/(n+1)!}{2^n/n!} = \\ \lim_{n \to \infty} \frac{2^{n+1}/(n+1)!}{2^n(n+1)!} = \\ \lim_{n \to \infty} \frac{2^{n+1}/(n+1)!}{2^n(n+1)!} = \\ \lim_{n \to \infty} \frac{2^{n+1}/(n+1)!}{2^n(n+1)!} = \\ \lim_{n \to \infty} \frac{2^{n+1}}{2^n(n+1)!} = \\ \lim_{n \to \infty} \frac{2^{n+1}}{2^n(n+1
        \underline{\lim}_{n\to\infty} \frac{2}{n+1}
        \lim_{n \to \infty} \frac{3^{n+1}/(n+1)^3}{\frac{3^n/n^3}{3^n(n+1)^3}} = \lim_{n \to \infty} \frac{3^{n+1}n^3}{\frac{3^n(n+1)^3}{3^n(n+1)^3}} = \lim_{n \to \infty} \frac{3^{n+1}n^3}{\frac{3^n(n+1)^3}{3^n(n+1)^3}} = \lim_{n \to \infty} \frac{3^{n+1}}{\frac{3^n(n+1)^3}{3^n(n+1)^3}} = \lim_{n \to \infty} \frac{3^n(n+1)^3}{\frac{3^n(n+1)^3}{3^n(n+1)^3}} = \lim_{n \to \infty}
        \lim_{n \to \infty} \frac{3n^3}{(n+1)^3}
           \frac{3}{3}. >
           \sum_{n=1}^{\infty} \frac{3^n}{n^3} \\ \sum_{n=1}^{\infty} \frac{1}{n^2 + 1}
        \lim_{n \to \infty} \frac{1/((n+1)^2 + 1)}{\frac{1/(n^2 + 1)}{(n+1)^2 + 1}} = \lim_{n \to \infty} \frac{n^2 + 1}{(n+1)^2 + 1} = 1

\frac{\overline{1}}{1} \cdot \sum_{n=1}^{\infty} \frac{1}{n^2}

                                                                                  _{r}atio2ApplyingtheRatioTestDeterminetheconvergenceof\sum_{n=1}^{\infty}\frac{n!n!}{(2n)!}
        \begin{array}{l} (2n)!\\ 2n! \\ 2n! \\ 3n! \\ 4! \\ 8! \\ 8! \\ 1 \\ 40, 320 \\ 2(4\cdot 3) \\ 2(4\cdot 3) \\ 1) \\ 1 \\ 2 \\ 48 \end{array}
        \lim_{n\to\infty} \frac{(n+1)!(n+1)!/\left(2(n+1)\right)!}{\frac{n!n!/(2n)!}{n!n!(2n+2)!}} = \lim_{n\to\infty} \frac{(n+1)!(n+1)!(2n)!}{\frac{n!n!(2n+2)!}{n!n!(2n+2)!}} Notingthat
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