Consider the following sequences. Show by making large vectors that the numerator and denominator approach 0/0 , infinity/infinity, 0*infintiy or any of the other indeterminant forms. Use large sequences to see what values the ratios approach. Can you change the problem to one about a variable x and a function and use L'hôpital's theorem. Can you use other theorems about limiting values to figure out answers theoretically?

$\frac{n^3}{\exp(n)}$;*#as n→infinity,*

 # Does the answer change with a different positive power of n?

$\frac{n}{\ln(n)}$;*# as n->infinity*

$\frac{\sin\left(\frac{1}{n}\right)}{\frac{1}{n}}$; *#as n→ infinity*

$\frac{\tan\left(\frac{\text{Pi}}{2}-\frac{1}{n}\right)}{n}$;*# as n ->infinity*

$\frac{(n^5+3\cdot n^4+2)}{4\cdot n^5+6\cdot n^3+7}$; *# as n-> infinity*

$\frac{\exp(n)}{n!}$; *# as n-> infinity*

$n^{\frac{1}{2}}\cdot\ln\left(1+\frac{1}{n^3}\right)$; *# as n-> infinity*

$\frac{\cos(n)}{n}$; *# as n-> infinity*

$\left(\left(8+\frac{1}{n}\right)^3-8^3\right)\cdot n$; *#as n→ infinity*

$\left(\tan\left(1-\frac{1}{n^3}\right)-\tan(1)\right)\cdot n^3$; *# as n-> infinity*

$\left(\int_0^{1+\frac{1}{n}}\exp(x^3)\,\mathrm{d}x-\int_0^1\exp(x^3)\,\mathrm{d}x\right)\cdot n$; *#as n-> infinity*