

Limit 2

1. Evaluate $\lim_{x \rightarrow 0} \frac{1 - \cos 3x}{x}$.
2. Evaluate $\lim_{x \rightarrow \infty} \frac{6x^4 + \sin x}{x^4 + 1}$.
3. Evaluate $\lim_{x \rightarrow 0} \sqrt{x} \left[1 + \sin^2 \left(\frac{2\pi}{x} \right) \right]$.
4. Find $\lim_{n \rightarrow +\infty} \frac{1^1 + 2^2 + 3^3 + \dots + (n-1)^{n-1} + n^n}{n^n}$.
5. Evaluate $\lim_{x \rightarrow 0^+} (\sin x)^{\frac{1}{\ln x}}$.
6. Evaluate $\lim_{n \rightarrow \infty} \left(\frac{1}{n+1} + \frac{1}{n+2} + \dots + \frac{1}{2n} \right)$.
7. Evaluate $\lim_{n \rightarrow -\infty} \frac{3n}{\sqrt{n^2 + 1}}$.
8. Find $\lim_{n \rightarrow +\infty} \left(\frac{2}{7^2} + \frac{2^3}{7^3} + \frac{2^5}{7^4} + \dots + \frac{2^{2n-1}}{7^{n+1}} \right)$.
9. Show that the limit of the sequence $\left\{ \frac{n}{2n+1} \right\}_{n=1}^{\infty}$ exists.
10. Find $\lim_{x \rightarrow -\infty} \frac{3x+1}{\sqrt{4x^2-1}}$.
11. Use L'hospital Rule to evaluate $\lim_{x \rightarrow \infty} (\sqrt{x^2 + 6x} - x)$.