**C Alexey A Bykov, 20 oct 2007 boombook@yandex.ru**

# Limits in symbolic form

## Limits by Asymptotic

$$\lim_{x \to 0} \frac{\sqrt[3]{1+x} - \sqrt[3]{1-x}}{\sqrt[4]{1+x} - \sqrt[4]{1-x}} \to \frac{4}{3}$$

$\sqrt[3]{1+x}$ converts to the series $1 + \frac{1}{3}\cdot x - \frac{1}{9}\cdot x^2 + \frac{5}{81}\cdot x^3 - \frac{10}{243}\cdot x^4 + \frac{22}{729}\cdot x^5 + O(x^6)$

$\sqrt[3]{1-x}$ converts to the series $1 - \frac{1}{3}\cdot x - \frac{1}{9}\cdot x^2 - \frac{5}{81}\cdot x^3 - \frac{10}{243}\cdot x^4 - \frac{22}{729}\cdot x^5 + O(x^6)$

$\sqrt[4]{1+x}$ converts to the series $1 + \frac{1}{4}\cdot x - \frac{3}{32}\cdot x^2 + \frac{7}{128}\cdot x^3 - \frac{77}{2048}\cdot x^4 + \frac{231}{8192}\cdot x^5 - \frac{1463}{65536}\cdot x^6 + O(x^7)$

$\sqrt[4]{1-x}$ converts to the series $1 - \frac{1}{4}\cdot x - \frac{3}{32}\cdot x^2 - \frac{7}{128}\cdot x^3 - \frac{77}{2048}\cdot x^4 - \frac{231}{8192}\cdot x^5 - \frac{1463}{65536}\cdot x^6 + O(x^7)$

$\sqrt[3]{1+x} - \sqrt[3]{1-x}$ converts to the series $\frac{2}{3}\cdot x + O(x^3)$

$\sqrt[4]{1+x} - \sqrt[4]{1-x}$ converts to the series $\frac{1}{2}\cdot x + O(x^3)$

$\frac{\sqrt[3]{1+x} - \sqrt[3]{1-x}}{\sqrt[4]{1+x} - \sqrt[4]{1-x}}$ converts to the series $\frac{4}{3} + O(x^2)$