

1 Granične vrednosti funkcija

Tablične granične vrednosti:

$$\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1, \lim_{x \rightarrow 0} \frac{a^x - 1}{x} = \ln a, \lim_{x \rightarrow 0} \frac{\ln(1+x)}{x} = 1, \lim_{x \rightarrow 0} \frac{(1+x)^\alpha - 1}{x} = \alpha, \lim_{x \rightarrow +\infty} \left(1 + \frac{1}{x}\right)^x = e, \lim_{x \rightarrow 0} (1+x)^{\frac{1}{x}} = e.$$

1. $\lim_{x \rightarrow 2} x^3 + 3x.$
2. $\lim_{x \rightarrow 1} \frac{x^3 + 3x^2 + 2x}{x + 1}.$
3. $\lim_{x \rightarrow 3} \frac{x^2 - 9}{x^2 - 3x}.$
4. $\lim_{x \rightarrow 0} \frac{x}{\sqrt{x+4} - 2}.$
5. $\lim_{x \rightarrow 0} \frac{\sqrt{1+x^2} - \sqrt{1+x}}{1 - \sqrt{1+x}}.$
6. $\lim_{x \rightarrow +\infty} \frac{2x + 3}{x + 5}.$
7. $\lim_{x \rightarrow +\infty} \frac{7x^2 + 6x - 9}{9x^3 + 8x^2}.$
8. $\lim_{x \rightarrow +\infty} \frac{2x^2 - 3x - 4}{\sqrt{x^4 + 1}}.$
9. $\lim_{x \rightarrow 0} \frac{\sqrt{2} - \sqrt{1 + \cos x}}{\sin^2 x}.$
10. $\lim_{x \rightarrow +\infty} x - \sqrt{x^2 - 4x}.$
11. $\lim_{x \rightarrow +\infty} \sqrt{x^2 + x - 1} - \sqrt{x^2 - x + 1}.$
12. $\lim_{x \rightarrow 8} \frac{\sqrt{9 + 2x} - 5}{\sqrt[3]{x} - 2}.$
13. $\lim_{x \rightarrow 0} \frac{\sin kx}{x}, k = \text{const}, k \neq 0.$
14. $\lim_{x \rightarrow 0} \frac{\sin kx}{\sin lx}.$
15. $\lim_{x \rightarrow 0} \frac{\sin^3 x}{x^2}.$
16. $\lim_{x \rightarrow +\infty} \frac{\sin x}{x}.$
17. $\lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2}.$
18. $\lim_{x \rightarrow \frac{\pi}{4}} \frac{1 - \sin 2x}{1 + \cos 4x}.$
19. $\lim_{x \rightarrow 0} \frac{\cos mx - \cos nx}{x^2}.$
20. $\lim_{x \rightarrow \infty} \frac{x + a^x}{x - a}.$
21. $\lim_{x \rightarrow 0} \left(\frac{\cos x}{\cos 2x}\right)^{\frac{1}{x^2}}.$
22. $\lim_{x \rightarrow \frac{\pi}{2}} (\sin x)^{tgx}.$
23. $\lim_{x \rightarrow 0} \frac{\ln \cos ax}{\ln \cos bx}.$
24. $\lim_{x \rightarrow 0} \frac{1 - \cos^a x}{x^2}.$
25. $\lim_{x \rightarrow 0} \frac{e^{x^2} - \cos^{\sqrt{2}} x}{x^2}.$

26. $\lim_{x \rightarrow 0} \frac{e^{x^3} - \sqrt{x^3 + 1}}{\ln(1 + \operatorname{tg} x - \sin x)}$.
27. $\lim_{x \rightarrow \infty} (\sqrt[3]{8x^3 + 9x^2} - \sqrt{4x^2 - 8x})$.
28. $\lim_{x \rightarrow a} \frac{a^x - x^a}{x - a}$.
29. $\lim_{x \rightarrow 0} \frac{\ln(\cos 3x)}{x(\sqrt{x+1} - 1)}$.
30. $\lim_{x \rightarrow \infty} \frac{\ln \frac{x+3}{x}}{1 - \sqrt{\frac{x-1}{x+1}}}$.