

Zadawa na 11.12.2024

Granice funkcji i ciągów: obliczyć granice

1. $\lim_{u \rightarrow \infty} \frac{(u+1)^2}{2u^2}$ (1/2)
2. $\lim_{u \rightarrow \infty} \frac{(u+1)^3 - (u-1)^3}{(u+1)^2 + (u-1)^2}$ (3)
3. $\lim_{u \rightarrow \infty} \frac{1 + \frac{1}{2} + \frac{1}{4} + \dots + \frac{1}{2u}}{1 + \frac{1}{3} + \frac{1}{9} + \dots + \frac{1}{3u}}$ (4/3)
4. $\lim_{u \rightarrow \infty} \frac{1}{4u}(1+2+\dots+u)$ (1/2)
5. $\lim_{k \rightarrow \infty} \frac{n!}{(n+1)! - n!}$ (0)
6. $\lim_{u \rightarrow \infty} \frac{\sqrt[3]{u^2+u}}{u+1}$ (0)
7. $\lim_{x \rightarrow 1} \frac{(x-1)\sqrt{2-x}}{x^2-1}$ (1/2)
8. $\lim_{x \rightarrow 1} \frac{x^m - 1}{x^n - 1}$ $m, n - l. \text{ cat } k.$ (m/n)
9. $\lim_{x \rightarrow \infty} \left(\frac{x^3}{2x^2-1} - \frac{x^2}{2x+1} \right)$ (1/4)
10. $\lim_{x \rightarrow \infty} \left(\frac{x^3}{x^2+1} - x \right)$ (0)
11. $\lim_{x \rightarrow \infty} \frac{(x+1)^{10} + (x+2)^{10} + \dots + (x+100)^{10}}{x^{10} + 10^{10}}$ (100)
12. $\lim_{h \rightarrow 0} \frac{\sqrt{x+h} - \sqrt{x}}{h}$ (1/2\sqrt{x})
13. $\lim_{x \rightarrow 1} \frac{x^2 - \sqrt{x}}{\sqrt{x} - 1}$ (3)
14. $\lim_{x \rightarrow \infty} (\sqrt{x+a} - \sqrt{x})$ (0)
15. $\lim_{x \rightarrow 0} \frac{\sin 3x}{x}$ (3) (reg. d'Hosp. loba)
16. $\lim_{x \rightarrow 0} \frac{\tan x}{x}$ (k) (reg. d'Hosp.)
17. $\lim_{x \rightarrow 0} \frac{\sin x}{x}$ (1) (reg. d'Hosp.)
18. $\lim_{h \rightarrow 0} \frac{e^h - 1}{h}$ (1) (z def. pochodnej)
19. $\lim_{x \rightarrow 1} \frac{e^x - e}{x - 1}$ (e) (reg. d'Hosp.)
20. $\lim_{x \rightarrow +\infty} \frac{x^2}{cx}$ (0) (2 mazy albo 3x reg. d'Hosp. loba)

Pochodne funkcji: obliczyć pochodne:

1. $y = \frac{x+1}{x-1}$
2. $y = \sin x + \cos x$
3. $y = \frac{1-x^2}{\sqrt{x}}$
3. $y = \frac{x}{x^2+1}$
4. $y = \frac{2}{x^3-1}$
5. $y = (1+2x)^{10}$
6. $y = (1-x^2)^{10}$
7. $y = \sqrt{\frac{x+1}{x-1}}$ znaleźć $y'(2)$
8. $y = \frac{x}{1-\cos x}$
9. $y = \arctg x^2$
10. $y = \sin \frac{1}{x}$
11. $y = \cos^3 4x$
12. $y = \sin(\sin x)$
13. $y = \frac{1}{\ln x}$
14. $y = \ln(1-2x)$
15. $y = \sqrt{\ln x}$
16. $y = x \ln x$
17. $y = x^x$
18. $y = x^{x^x}$
14. $y = x \ln x$