

1. Faktoriál

Upravte nasledujúce výrazy:

$$1. \frac{(n+6)!}{(n+4)!} - \frac{n!}{(n-2)!} \quad [(n+6)(n+5) - n(n-1)]$$

$$2. \frac{(2n+1)!}{(2n)!} \cdot \frac{(n+5)!}{(n+3)!} \quad [(2n+1)(n+5)(n+4)]$$

$$3. \frac{(n+3)!}{n!(n+1)} \quad [(n+3)(n+2)]$$

$$4. \frac{(n^2-4) \cdot n!}{(n+2)!} + \frac{n!}{(n-3)! \cdot (n-2)} \quad \left[\frac{(n-2)}{n+1} + n(n-1) \right]$$

$$5. \frac{(2n-1)!}{3 \cdot (2n)!} \cdot \frac{n!}{(n-2)!} \quad \left[\frac{1}{6}(n-1) \right]$$

$$6. \frac{n!}{(n-1)!} \quad [n]$$

$$7. \frac{(n+3)!}{(n+1)!} \quad [(n+3)(n+2)]$$

$$8. \frac{(n-5)!}{(n-7)!} \quad [(n-5)(n-6)]$$

$$9. \frac{(n+1)! - n!}{(n+1)!} \quad \left[\frac{n}{n+1} \right]$$

$$10. \frac{3n}{(n-1)!} + \frac{1}{(n-3)!} \quad \left[\frac{n^2+2}{(n-1)!} \right]$$

$$11. \frac{n+1}{n!} - \frac{2n+1}{(n+1)!} \quad \left[\frac{n^2}{(n+1)!} \right]$$

2. Limita postupnosti

Vypočítajte limitu postupnosti:

$$1. \lim_{n \rightarrow \infty} \frac{4n^2 - 5n + 2}{2n^2 + 3} \quad [2]$$

$$2. \lim_{n \rightarrow \infty} \frac{n^2 + 2}{3n^2} \quad \left[\frac{1}{3} \right]$$

$$3. \lim_{n \rightarrow \infty} \frac{3n^4 - 7n^2 + 10}{n-1} \quad [\infty]$$

$$4. \lim_{n \rightarrow \infty} \frac{n^2 + 3n - 10}{4n^5 + n^2} \quad [0]$$

$$5. \lim_{n \rightarrow \infty} \frac{n^3 + 5n^2 + 2}{2n^3 - n} \quad \left[\frac{1}{2} \right]$$

6. $\lim_{n \rightarrow \infty} \frac{3n^5+8}{n^2-4n+5}$ [∞]
7. $\lim_{n \rightarrow \infty} \frac{3n^5+n^2-1}{2n^7+n^3}$ [0]
8. $\lim_{n \rightarrow \infty} \left(1 + \frac{2}{n+3}\right)^n$ [e^2]
9. $\lim_{n \rightarrow \infty} \left(1 - \frac{1}{2n+2}\right)^{2n}$ [e^{-1}]
10. $\lim_{n \rightarrow \infty} \left(1 + \frac{3}{n+1}\right)^{n-1}$ [e^3]
11. $\lim_{n \rightarrow \infty} \left(\frac{n+1}{n+2}\right)^n$ [e^{-1}]
12. $\lim_{n \rightarrow \infty} \left(\frac{n+4}{n+1}\right)^n$ [e^3]
13. $\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n+5}\right)^{n^2}$ [∞]
14. $\lim_{n \rightarrow \infty} \left(1 + \frac{5}{n^2}\right)^{n+1}$ [1]

3. Rozklad na parciálne zlomky

Rozložte na parciálne zlomky nasledujúce výrazy:

1. $\frac{1}{(n+1)(n+2)}$ [$\frac{1}{n+1} - \frac{1}{n+2}$]
2. $\frac{14}{(n+3)(n-4)}$ [$\frac{2}{n-4} - \frac{2}{n+3}$]
3. $\frac{-2}{n^3-n}$ [$\frac{-1}{n-1} - \frac{1}{n+1} + \frac{2}{n}$]
4. $\frac{4}{4n^2+4n-3}$ [$\frac{1}{2n-1} - \frac{1}{2n+3}$]
5. $\frac{1}{n^2+6n+8}$ [$\frac{-1}{2(n+4)} - \frac{1}{2(n+2)}$]
6. $\frac{1}{(5n-4)(5n+1)}$ [$\frac{1}{5(5n-4)} - \frac{1}{5(5n+1)}$]
7. $\frac{3}{n^2+3n}$ [$\frac{1}{n} - \frac{1}{n+3}$]