DIFERENČNÍ ROVNICE

Najděte všechna řešení diferenčních rovnic (s počátečními podmínkami).

1. $y(n+2)+4y(n+1)+4y(n)=0$

2. $y(n+2)-3y(n+1)+2y(n)=0$

3. $y(n+2)-2y(n+1)-3y(n)=0$, $y(1)=2$, $y(2)=1$

4. $y(n+2)-y(n+1)-y(n)=0$, $y(1)=y(2)=1$

5. $y(n+4)+6y(n+2)+9y(n)=0$

6. $y(n+2)-2y(n+1)+2y(n)=\cos\frac{\pi}{2}n$

7. $y(n+3)-y(n+2)-2y(n+1)+2y(n)=n+2^n$

8. $8y(n+3)+y(n)=3n+1/2^n$

9. $y(n+2)-3y(n+1)+2y(n)=n^2$, $y(1)=3$, $y(2)=2$

10. $y(n+2)-y(n)=17$, $y(1)=y(2)=0$

VÝSLEDKY A NÁVODY

1. $y(n)=c_1(-2)^n+c_2n(-2)^n$, $c_1,c_2\in\mathbf{R}$ **2.** $y(n)=c_1+c_22^n$, $c_1,c_2\in\mathbf{R}$ **3.** $y(n)=-\frac{5}{4}\cdot(-1)^n+\frac{1}{4}\cdot 3^n$ **4.** $y(n)=\frac{1}{\sqrt{5}}\left(\frac{1+\sqrt{5}}{2}\right)^n-\frac{1}{\sqrt{5}}\left(\frac{1-\sqrt{5}}{2}\right)^n$ **5.** $y(n)=c_1(\sqrt{3})^n\cos\frac{\pi}{2}n+c_2(\sqrt{3})^n\sin\frac{\pi}{2}n+c_3n(\sqrt{3})^n\cos\frac{\pi}{2}n+c_4n(\sqrt{3})^n\sin\frac{\pi}{2}n$ **6.** $y(n)=\frac{1}{5}\cos\frac{\pi}{2}n-\frac{2}{5}\sin\frac{\pi}{2}n+c_1(\sqrt{2})^n\cos\frac{\pi}{4}n+c_2(\sqrt{2})^n\sin\frac{\pi}{4}n$ **7.** $y(n)=-\frac{1}{2}n^2-\frac{3}{2}n+2^{n-1}+c_1(\sqrt{2})^n+c_2(-\sqrt{2})^n+c_3$ **8.** $y(n)=\frac{1}{3}n-\frac{8}{9}+\frac{1}{2}2^{-n}+c_1(-\frac{1}{2})^n+c_2(\frac{1}{2})^n\cos(\frac{\pi}{3}n)+c_3(\frac{1}{2})^n\sin(\frac{\pi}{3}n)$ **9.** $y(n)=-\frac{1}{3}n^3-\frac{1}{2}n^2-\frac{13}{6}n+1+5\cdot 2^{n-1}$ **10.** $y(n)=\frac{17}{2}n-\frac{51}{4}-\frac{17}{4}(-1)^n$