$f_2(x) = \cos(2x)$; $y_{p2} = A\cos(2x) + B\sin(2x)$

$a = 0 \quad m, n = 0$

$M = 0 \; ; b = 2$

$\lambda^* = 2i \Rightarrow k := 0$

$y_{p2} = e^{0x} \cdot x^0 [A\cos(2x) + B\sin(2x)]$

$y_{p2}^* = A\cos(2x) + B\sin(2x)$

$y_{p2}'' = -2A\sin(2x) + 2B\cos(2x)$

$y_{p2}''' = -4A\cos(2x) - 4B\sin(2x)$

$y_{p3}''' = 8A\sin(2x) - 8B\cos(2x)$

dosadíme do zadání : $y_{p2}''' - 4y_{p2}' = \cos(2x)$

$8A\sin(2x) - 8B\cos(2x) + 8A\sin(2x) - 8B\cos(2x) = \cos(2x)$

$\sin(2x): \quad 16A = 0 \quad \to A = 0$

$\cos(2x): \quad -8B - 8B = 1 \quad \to B = -\frac{1}{16}$

$\underline{y_{p2} = -\frac{1}{16}\sin(2x)}$

$y = y_h + y_{p1} + y_{p1}$

$\underline{y = c_1 + c_2 e^{2x} + c_3 e^{-2x} + \frac{x}{8} e^{2x} - \frac{1}{16}\sin(2x)}$

Př. $y''' - 4y'' + 5y = f(x)$

① homog.

$\lambda^3 - 4\lambda^2 + 5\lambda = 0$

$\lambda = 1 \quad (\lambda^3 - 4\lambda^2 + 5\lambda - 2) : (\lambda - 1) = \lambda^2 - 3\lambda + 2$

$-(\lambda^3 - \lambda^2)$

$-3\lambda^2 + 5\lambda - 2$

$-(-3\lambda^2 + 3\lambda)$

$2\lambda - 2$

0

$(\lambda - 2)(\lambda - 1)(\lambda - 1) = 0$

$\lambda_1 = 2 \sim u_1 = e^{2x}$

$\lambda_{2,3} = 1 \sim u_{2,3} = e^x$

$y_h = c_1 e^{2x} + c_2 e^x + c_3 x e^x$

$f(x) = \underbrace{x^2 - 3}_{f_1} + \underbrace{7xe^x}_{f_2} \underbrace{- 3\cos x}_{f_3} + \underbrace{e^x \sin(2x)}_{f_4} \underbrace{- \operatorname{tg}\frac{x}{2}}_{f_5}$

$f_1(x) = x^2 - 3 \quad y_{p1} = Ax^2 + Bx + C$

$a = 0$

$b = 0, k = 0$

$\lambda^* = 0$

$m = 2, n = 0$

$M = 2$

$f_3(x) = -3\cos x \quad : \quad y_{p3} = A\cos x + B\sin x$

$f_4(x) = e^x \sin(2x) \quad : \quad y_{p4} = e^x [A\cos(2x) + B\sin(2x)]$

$a = 1, b = 2$

$\lambda^* = 1 + 2i \; ; k := 0$

$f_2(x) = 7xe^x : \quad y_{p2} = (Ax + B)e^x x^2$

nemusíme dopočítávat

$a = 1, b = 0$

$\lambda^* = 1 + 0i = 1$

$k := 2$

$m = 1, n = 0$

$M = 1$

$y_{p2} = e^x x^2 (Ax + B)$