(2.) Str. 24

$2y'' + y' + y = x(t)$,

ako je $x(t) = (t+3)s(t)$, uz uslove $y(0)=2$, $y'(0)=1$

$2y'' + y' + y = x(t)$

$2y'' + y' + y = t+3 \to 2y'' = t+3-y'-y \to y'' = \frac{t}{2} + \frac{3}{2} - \frac{y'}{2} - \frac{y}{2}$

$2s^2Y(s) - 2sy(0) - 2y'(0) + sY(s) - y(0) + Y(s) = \frac{1}{s^2} + \frac{3}{s}$

$2s^2Y(s) - 4s - 2 + sY(s) - 2 + Y(s) = \frac{1}{s^2} + \frac{3}{s}$

$2s^2Y(s) + sY(s) + Y(s) = \frac{1}{s^2} + \frac{3}{s} + 4s + 4$

$Y(s)(2s^2+s+1) = \frac{1+3s+4s^3+4s^2}{s^2}$

$Y(s) = \frac{4s^3+4s^2+3s+1}{s^2(2s^2+s+1)}$

$\frac{4s^3+4s^2+3s+1}{s^2(2s^2+s+1)} = \frac{A}{s} + \frac{B}{s^2} + \frac{Cs+D}{2s^2+s+1} \quad / \cdot s^2(2s^2+s+1)$

$4s^3+4s^2+3s+1 = As(2s^2+s+1) + B(2s^2+s+1) + s^2(Cs+D)$

$4s^3+4s^2+3s+1 = 2As^3 + As^2 + As + 2Bs^2 + Bs + B + Cs^3 + Ds^2$

$4s^3+4s^2+3s+1 = s^3(2A+C) + s^2(A+2B+D) + s(A+B) + B$

$2A+C=4 \qquad A+2B+D=4 \qquad A+B=3 \qquad \boxed{B=1}$

$\boxed{C=0} \qquad D=4-4 \qquad \boxed{A=2}$

$\boxed{D=0}$

$\frac{4s^3+4s^2+3s+1}{s^2(2s^2+s+1)} = \frac{2}{s} + \frac{1}{s^2} \to \boxed{y(t) = 2+t}$ ✓