

Praktikum 11

$$1) \quad sY(s) - \underbrace{y(0)}_3 + 2Y(s) = \frac{5}{25+s^2}$$

$$\Rightarrow \bar{Y}(s) = \left(\frac{5}{25+s^2} + 3 \right) / (s+2)$$

$$= \frac{5}{(25+s^2)(s+2)} + \frac{3}{s+2}$$

$$\frac{A+Bs}{25+s^2} + \frac{C}{s+2}$$

$$C = \frac{5}{29}$$

$$B = -\frac{5}{29}$$

$$A = 10/29$$

$$\Rightarrow Y(s) = \frac{1}{29} \frac{10-5s}{25+s^2} + \left(3 + \frac{5}{29}\right) \frac{1}{s+2}$$

$$\Rightarrow y(t) = \frac{1}{29} \left(2\sin(5t) - 5\cos(5t) \right) + \left(3 + \frac{5}{29} \right) e^{-2t}$$

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

$$= \frac{A}{s} + \frac{B+Cs}{s^2+4} = \frac{As^2+4A+Bs+Cs^2}{s(s^2+4)}$$

$$\Rightarrow A = \frac{1}{4}, B = 1, C = -\frac{1}{4}$$

$$\rightarrow = \frac{1}{4} \frac{1}{s} + \frac{1 - \frac{1}{4}s}{s^2+4}$$

Also Original function:

$$\frac{1}{4} + \frac{1}{2} \sin(2t) - \frac{1}{4} \cos(2t)$$

$$3) \quad x^2 y = 0 \Leftrightarrow x = 0 \vee y = 0$$

$$x^2 y = 1 \Leftrightarrow y = \frac{1}{x^2}$$

