

Zad. 2

$$y'' + y = t^2 \cos t, \text{ Niech } \mathcal{L}\{y\} = F(s), \text{ wtedy}$$

$$s^2 F(s) - s y(0) - y'(0) + F(s) = \mathcal{L}\{t^2 \cos(t)\}(s)$$

$$\frac{d^2}{ds^2} \mathcal{L}\{\cos t\}$$

$$\frac{d^2}{ds^2} \frac{s}{s^2+1} \text{ (TABELKA)}$$

$$\frac{2s(s^2-3)}{(1+s^2)^3}$$

$$F(s)(s^2+1) = \frac{2s(s^2-3)}{(1+s^2)^3} + s + 1$$

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

$$y = \mathcal{L}^{-1}\{F\} = \mathcal{L}^{-1}\left\{\frac{2s(s^2-3)}{(1+s^2)^4}\right\} + \mathcal{L}^{-1}\left\{\frac{1+s}{1+s^2}\right\}$$

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cost + sint

$$\mathcal{L}^{-1}\left\{\frac{2s^3}{(1+s^2)^4} - \frac{6s}{(1+s^2)^4}\right\}$$

|| WOLFRAM

$$\frac{1}{12} (2t^3 \sin t + 3t^2 \cos t - 3t \sin t)$$

$$y(t) = \frac{1}{12} (2t^3 \sin t + 3t^2 \cos t - 3t \sin t) + \cos t + \sin t$$