Solve by the method of undetermined coefficients:

Set 3.6: 4, 12, 14, and

$$\begin{aligned} \dot{x} &= -x + 3y + z + t \\ \dot{y} &= x - y + 3z + t^2 \\ \dot{z} &= -3x + y - 3z + t^3 \end{aligned}$$

(in the last question, find the *particular* solution only).

Also solve

$$\begin{aligned} y_1' &= -4y_1 + 3y_2 - 3y_3 + \frac{3}{1+x} \\ y_2' &= -5y_1 + 4y_2 - 2y_3 + \frac{2}{1+x} \\ y_3' &= y_1 - y_2 + 3y_3 - \frac{4+3x}{(1+x)^2} \end{aligned}$$