

## Extra Homework Set 4 - Conversion to a first-order system

Convert the following problem, including initial conditions, to a first-order system:

$$\begin{aligned}x'' &= y \sin(x) + (z')^2, & x(0) &= \pi/2, & x'(0) &= 0, \\y' &= (x + yz) \exp(-t), & y(0) &= 1, \\z'' &= (1 + z^2)^{-1}y \cos(x) + \cos(5t), & z(0) &= 0, & z'(0) &= -1.\end{aligned}$$