

1. Solve the ODE:  $\frac{dy}{dx} = \frac{x^2}{1+y^2}$

2. Solve the ODE:  $\frac{dy}{dx} = xe^{x+y}$

3. Solve the ODE:  $ty' + 2y = \sin t, \quad t > 0$

4. Solve the IVP:  $y' - 2y = e^{2t}$ ,  $y(0) = 2$

5. Solve the IVP:  $ty' + (t + 1)y = t$ ,  $y(\ln 2) = 1$ ,  $t > 0$