1. Find the rest solution to

\[ y'' - y = 4 \sin t. \]

Do the same for

\[ y'' - y = 4e^t. \]

2. Show that the equation

\[ (3e^{2y}x^\frac{1}{2} - x)y' = 1 \]

becomes an equation of Bernoulli type if \( x \) and \( y \) are interchanged. Solve that equation and obtain an equation for \( x \). Find an explicit formula for \( y = y(x) \) for the solution satisfying \( y(1) = 0 \).

3. Solve

\[ 2t^2 y'' + (y')^3 = 2t y'. \]

4. Solve

\[ y'' + (y')^2 = 2e^{-y}. \]

5. Solve

\[ y'' + 7y' + 12y = 0 \]

subject to the initial conditions \( y(0) = 1, \ y'(0) = 4 \).