For the equations 1-2, where one solution $y_1(t)$ from a fundamental set is given,
(a) find the other solution $y_2(t)$ by variation of parameters;
(b) write down the general solution;
(c) find the solution of the initial value problem;
(d) find the general solution of the nonhomogeneous equation with right-hand side $f(t)$.

1. $t^2y'' - ty' + y = 0, \ t > 0; \ y_1(t) = t; \ y(1) = 1, \ y'(1) = 1; \ f(t) = t$;
2. $(t - 1)y'' - ty' + y = 0, \ t < 1; \ y_1(t) = e^t; \ y(0) = 0, \ y'(0) = 1; \ f(t) = (t - 1)e^{-t};$

Story Problems from Section 3.7.
4. Problem 11.
8. Problem 27.