Euler-Cauchy equation

$$x^2 y'' + axy' + by = 0$$

1. Write the auxiliary equation
   $m^2 + (a-1)m + b = 0$.

2. Find the roots m_1, m_2.

3. If the roots are real and $m_1 \neq m_2$, then $y_1 = x^{m_1}$ and $y_2 = x^{m_2}$ is a basis of solutions and general solution is

   $$y(x) = c_1 x^{m_1} + c_2 x^{m_2}.$$

4. Given an initial value problem

   $$y(x_0) = K_0, \ y'(x_0) = K_1,$$

   find a particular solution by determining the constants c_1 and c_2.