**1.** Solve $y''' - 2y'' + 2y' = 0$, $y(0) = 1$, $y'(0) = 0$, $y''(0) = 0$.

**2.** $y(x) = e^x$ solves $y'' - 2y' + y = 0$. Find the general solution by reduction of order.

**3.** Find the general solution to $y^{(5)} + 2y''' + y' = 0$. Solve IVP $y(0) = 1$, $y'(0) = y''(0) = y'''(0) = y^{(4)}(0) = 0$.

**4.** Find the fundamental set of $y^{(5)} - 2y^{(4)} - 16y' + 32y = 0$.

**5.** Solve $4y'' + 4y' + y = 0$.

**6.** Solve $y^{(5)} + 8y''' + 16y' = 0$.