1. Solve $xy' = y + 2x^3$ (just find general solution)

2. Solve $y' + \frac{3}{x}y = \frac{2}{x^2}$ with the condition that $y(1) = 2$.

3. Solve $y'x = y^2 - 1$ with the condition that $y(1) = 2$.

4. Solve $2xy - 3x^2 + (x^2 - 2y)y' = 0$ (just find general solution)

5. Solve $y'' + y' - 6y = 0$ with the condition that $y(0) = 1$ and $y'(0) = 0$.

6. Solve $y'' + y = 0$ with the condition that $y(0) = 2$ and $y'(0) = 3$.

7. Solve $y'' + 2y' + y = 0$ with the condition that $y(0) = 1$ and $y(1) = 3$. Hint: With only one root, get a second solution by multiplying C_1e^{rt} by x to obtain C_2xe^{rt}.