Notes: ‘fundamental set of solutions’ means ‘basis for solutions to the homogeneous ODE’. Some of this material will be covered on Thursday, but it may be useful to review sections 3.1 and 3.3 in advance of class.

Update: second part added.

Problems:
- Section 3.1: 7, 11, 16, 28
- Section 3.2: 28
- Section 3.3: 17, 18, 34, 35.
- AHP: 37, 38.

Second part.
- Section 3.4: 18
- Section 3.5: 8, 16 Hint: see table 3.5.1..

P1 (linear independence of solutions).
Consider the ODE
\[ ay'' + by' + cy = 0. \]
whose characteristic polynomial has roots \( \lambda_1, \lambda_2 \).

a) Verify the claim that \( e^{\lambda_1 t} \) and \( e^{\lambda_2 t} \) are linearly independent solutions when \( \lambda_1 \neq \lambda_2 \) (using the Wronskian).

b) If \( \lambda_1 \) is complex, show that the real and imaginary parts of \( e^{\lambda_1 t} \) are linearly independent.