Exercises:

Ex 1.1 = Exercises 01 - 02 of Tutorial 1
Formulate the classical assumptions which we have to impose on the data \( \{ a_i, c_i, b_i, f_i, g_i, \Omega \} \) of (5).
Provide sufficient conditions in order to ensure that a generalized solution \( u \in V_g \cap X \cap H^2(\Omega) \) of (6) is also a solution of (5) in the classical sense!
Consider first the Dirichlet problem for the Poisson equation for the training:

\[
(5)_{\text{Poisson}} \quad \begin{align*}
\text{Find} & \; u \in X := C^2(\Omega) \cap C(\overline{\Omega}) : \\
- \Delta u(x) &= f(x), \; x \in \Omega \subset \mathbb{R}^d \; (\forall) \\
u(x) &= g(x), \; x \in \Gamma = \partial \Omega \subset \mathbb{S}^1
\end{align*}
\]

Ex 1.2 = Exercise 03 : Show that in the following cases a) - c) the assumption of the Lax-Mil-Trotz are satisfied, and compute \( \mu_1 \) and \( \mu_2 \) ! We assume (7) and
a) \( b_1 = 0; \; c(x) > 0 \; \forall x \in \Omega; \; a(x) > 0 \; \forall x \in \Omega_1 = \text{meas}_2(\Omega) \) \( (> 0) \); 
b) \( b_1 = 0; \; c = 0; \; a(x) = \text{const} > 0 \; \forall x \in \Omega_1 = \text{meas}_2(\Omega) \) \( (> 0) \); 
c) \( b_1 = 0; \; c(x) > 0 = \text{const} > 0 \; \forall x \in \Omega_1 = \text{meas}_2(\Omega) \) \( (> 0) \);