1. Verify Example 10 on page 65 of the notes
(http://web.cs.elte.hu/summerschool/2019/egyeb/ssm2019.pdf ;
a link is provided in the course description).

2. Prove the identity of line 4 of Theorem 12 (page 66) of the notes about the vector space of generalized q-colorings of connected sums.

3. Suppose that (C_1, ∂_1) and (C_2, ∂_2) are two chain complexes and $f_1, f_2 \colon C_1 \to C_2$ are two chain maps. Show that if f_1, f_2 are chain homotopic, i.e. there is a homomorphism $\phi \colon C_1 \to C_2$ satisfying

$$f_1 - f_2 = \partial_2 \circ \phi + \phi \circ \partial_1,$$

then the induced maps on homologies $H(f_i) \colon H(C_1, \partial_1) \to H(C_2, \partial_2)$ are equal.