07-14-2015

PROBLEM SESSION

(1) Decide what group G fits in the following exact sequences. There may be more than one possibility for each exact sequence.
  (a) $0 \to \mathbb{Z}/2 \to G \to \mathbb{Z}/2 \to 0$
  (b) $0 \to \mathbb{Z} \to G \to \mathbb{Z}/2 \to 0$
  (c) $0 \to \mathbb{Z} \to G \to \mathbb{Z} \to 0$
(2) What is $H_*(\mathcal{C})$ for the following $\mathcal{C}$
  (a) $\mathcal{C} = \{(\epsilon_0, \ldots, \epsilon_n) \mid \epsilon_i = 0, 1\} \backslash \{(0, \ldots, 0), (1, \ldots, 1)\}$ where
$$(\epsilon_0, \ldots, \epsilon_n) < (\epsilon'_0, \ldots, \epsilon'_n)$$
  if $\epsilon_i \leqq \epsilon'_i$ for $i = 0, \ldots, n$. You should start by doing this exercise with small n.
  (b) $\mathcal{C} = \mathbb{Z}$ with the usual ordering.
  (c) $\mathcal{C} = \mathbb{R}$ with the usual ordering.

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