Flows and cycles in graphs – Exercises 4

1. Let G be a graph, Γ a group. Suppose edges e, f form a 2-cut in the graph G. Prove that G has a Γ-NZF if and only if G/e does.

2. Prove that for some k and Γ it is true that every k-edge-connected graph G has a Γ-NZF φ with the additional property that for every pair of edges e, f we have $\varphi(e) + \varphi(f) \neq 0$.