Exercise 7

For the following exercise, we assume the solution of Exercise 6 with two simplifications:
First, attributes are not considered. Second, parameter of graph rewrite rules are not
considered, as well.

a) Define the graph rewrite rule `enqueue` formally as a triple $r = (L, K, R)$.

b) Starting from the empty graph, apply the rule `newqueue`, followed by two
   applications of `enqueue`. Draw the corresponding sequence of graphs G_1, G_2, G_3 (G_i
   denotes the graph after applying the ith rule in the sequence.

c) Define the graph G_2 formally as a triple $G_2 = (V, E, l)$.

d) Execute the application of `enqueue` to G_2 formally by
   - defining an isomorphism $h : L \rightarrow G_L$, where G_L is a partial graph of G_2,
   - calculating the intermediate graph H, which does not contain the images of
     elements occurring in L but not in K,
   - calculating the final graph G_3.

e) Discuss: In which ways would the graph rewrite rules for queues be affected, if
   - subgraphs would be required for applying graph rewrite rules,
   - homomorphisms rather than isomorphisms would be allowed for matching the left-
     hand sides.