# The Theory of Computation

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*Solution Manual*

*Chapter 7, Problem 7.5*

We reduce *FVS* (see Additional Problem 4) to this problem. The simplest way is to replace each vertex of *FVS* by a pair of vertices with an arc between them, with the vertex at the tail being used for all in-arcs and the vertex at the head for all out-arcs. This clearly does not add new cycles; removing a vertex in *FVS* has exactly the same effect as removing the corresponding arc in *FAS*.