Reductions

1/3 points earned (33%)

You haven't passed yet. You need at least 80% to pass.
Review the material and try again! You have 3 attempts every 8 hours.

Review Related Lesson

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0 / 1
points

1.
(seed = 561300)

Which of the following problems can be linear-time reduced *to* the standard maximum st-flow problem in digraphs? Check all that apply.

- [x] Given a digraph with positive edge weights and two distinct vertices s and t, find a minimum capacity st-cut.

Correct

- [x] Given an undirected graph with positive edge weights and two distinct vertices s and t, find a maximum flow between s and t.

Correct

- [ ] Given a bipartite graph with positive edge weights, find a matching of maximum cardinality of maximum weight.

Un-selected is correct

- [ ]

Given a digraph with positive edge weights and two disjoint *sets* of vertices S and T, find a minimum capacity cut where all vertices in S are on one side and all vertices in T are on the other side.

This should be selected

☐ Given a graph (not necessarily bipartite), find a matching of maximum cardinality.

Un-selected is correct

✔ 1 / 1 points

2.
(seed = 289346)

Which problems are known to have the same asymptotic complexity as multiplying two N-bit integers? Check all that apply.

☐ Adding two N-bit integers.

Un-selected is correct

☐ Computing the remainder when dividing one N-bit integer into an N-bit integer.

Correct

☐ Determining whether an N-bit integer is prime.

Un-selected is correct

☐ Computing the square root of an N-bit integer, and rounding it down to the nearest integer.

Correct

☐ Factoring an N-bit integer.

Un-selected is correct

✖ 0 / 1 points

3.
(seed = 603748)

Suppose that problem A linear-time reduces to problem B. Which of the following can you infer? Check all that apply.

☐ If A can be solved in linear time, then B can be solved in poly-time.

This should not be selected

☐ A can be solved in poly-time.

Un-selected is correct

☐ B can be solved in poly-time.

Un-selected is correct

☐ If B can be solved in linear time, then so can A.

This should be selected

☐ If A can be solved in poly-time, then so can B.

This should not be selected
