Answers to the exercises for chapter:

1. If the decision problem can be solved, the optimization problem can be solved by asking about various values of the bound. This means the decision problem will be solved a logarithmic number of times. This only works if the bound takes on integer values; for rational or irrational values bisection search will not terminate.
   A second assumption is that lower and upper bounds are given. This is a reasonable assumption in many problems; for instance, in the traveling salesman problem a linear time algorithm gives the sum of all distances between cities, which is an upper bound. The lower bound is zero.
2. *no answer given*
3. The modulo operation is not an $O(1)$ operation. For $n \to \infty$, you have to take the length of the number into account.