Describe algorithms for the following problems. The input for each problem is string $\langle M, w \rangle$ that encodes a standard (one-tape, one-track, one-head) Turing machine M whose tape alphabet is $\{0, 1, \square\}$ and a string $w \in \{0, 1\}^*$.

1. Does M accept w after at most $|w|^2$ steps?
2. If we run M with input w, does M ever move its head to the right?

2½. If we run M with input w, does M ever move its head to the right twice in a row?

2¾. If we run M with input w, does M move its head to the right more than $2^{|w|}$ times?

3. If we run M with input w, does M ever change a symbol on the tape?

3½. If we run M with input w, does M ever change a $\square$ on the tape to either 0 or 1?

4. If we run M with input w, does M ever leave its start state?

In contrast, as we will see later, the following problems are all undecidable!

1. Does M accept w?

1½. If we run M with input w, does M ever halt?

2. If we run M with input w, does M ever move its head to the right three times in a row?
3. If we run M with input w, does M ever change a $\square$ on the tape to 1?

3½. If we run M with input w, does M ever change either 0 or 1 on the tape to $\square$?

4. If we run M with input w, does M ever reenter its start state?