

## 获得的答案

Consider the steps for the legitimate turing machine:

$M_{\text{bad}}$  = " The input is a polynomial P over variables  $x_1, \dots, x_k$

Step 1: Try all possible values of  $x_1, \dots, x_k$  to integer values.

Step 2: Evaluate P on these values

Step 3: If any of these settings evaluates to 0, accept; otherwise, reject"

- From the step 1 to store all the values turing machine require infinite memory location. So, this is not possible to accept the machine.
- For the Step 2, infinite processing time to require all the values for evaluation. So, this step also not possible to accept the machine.
- If the above two steps are not possible, then the step 3 is rejected.

So, the Turing machine  $M_{\text{bad}}$  could require **infinite time and infinite steps** to try all of them.

But the above settings are required that every stage in the Turing machine description be completed in a finite number of steps.

Thus, this description is not suitable for the legitimate Turing machine.