To prove that a language is not decidable, you may take as theorems that the following languages are not decidable:

- $H = \{<M, w> : \text{TM } M \text{ halts on input string } w\}$
- $H_{\epsilon} = \{<M> : \text{TM } M \text{ halts on the empty tape}\}$
- $H_{\text{ANY}} = \{<M> : \text{there is any string on which TM } M \text{ halts}\}$
- $L_{\text{ALL}} = \{<M> : \text{TM } M \text{ halts on all inputs}\}$
- $\text{EqTMs} = \{<M_a, M_b> : L(M_a) = L(M_b)\}$

To prove that a language is not semidecidable, you may take as theorems that the following languages are not semidecidable:

- $\neg H = \{<M, w> : \text{TM } M \text{ does not halt on input string } w\}$
- $\neg H_{\text{ANY}} = \{<M> : \text{there does not exist any string on which } M \text{ halts}\}$