Let \( f \) be a P-selector function for SAT. We give a deterministic polynomial-time algorithm for SAT. On input \( F \), without loss of generality, let the variables be, for some \( k \), \( v_1, v_2, \ldots, v_k \) (otherwise rename the variables so that this holds). If \( k = 0 \) we are done; \( F \) has no variables and can be evaluated in polynomial time. Otherwise, proceed as follows. Let \( F_{\text{list}} \) denote \( F \) with the substitutions listed in \( \text{list} \) performed. For example, \( F_{v_k=1} \) denotes \( F \) with \( v_k \) assigned the value true (in such lists, 1 will denote true and 0 will denote false). Run \( f(F_{v_k=1}, F_{v_k=0}) \). Note that 

\[ F \in \text{SAT} \iff f(F_{v_k=1}, F_{v_k=0}) \in \text{SAT}. \]

If \( k = 1 \) then we are done; \( f(F_{v_k=1}, F_{v_k=0}) \) has no unassigned variables and can be evaluated in polynomial time. If \( k > 1 \), let \( b_k = 1 \) if \( f(F_{v_k=1}, F_{v_k=0}) = F_{v_k=1} \) and otherwise let \( b_k = 0 \). Run \( f(F_{v_k=b_k}, v_{k-1}=1, F_{v_k=b_k}, v_{k-1}=0) \). Note that 

\[ F \in \text{SAT} \iff f(F_{v_k=b_k}, v_{k-1}=1, F_{v_k=b_k}, v_{k-1}=0) \in \text{SAT}. \]

If \( k = 2 \) we are done via evaluating \( f(F_{v_k=b_k}, v_{k-1}=1, F_{v_k=b_k}, v_{k-1}=0) \), which has no unassigned variables. Otherwise, continue in a similar fashion. After at most \( k \) applications of \( f \) to pairs of formulas each no longer than the original input, we have correctly determined whether \( F \in \text{SAT} \).