

1. Forward Solve Sampling

Sample $m=8$ stochastic CoT solutions ($T=0.7$)



(r_i, a_i)

2. Backsolve (Plug-Back) Verification

Verification Prompt $(x, a_i, r_i) \rightarrow \text{CONFIDENCE: } B_i \in [0,1], \text{VERDICT (PASS/FAIL) (T=0.3)}$



B_i

3. Adversarial Falsification Ensemble

$k=3$ Refuter Prompts (Unit/Quantity, Algebra/Arithmetic, Constraint Completeness)

$\rightarrow \text{ERROR_PROB: } p_{i,j} \in [0,1] \text{ (T=0.7)}$
 $F_i = 1 - \frac{1}{k} * \sum p_{i,j}$



F_i

4. Anti-Verbosity Length Penalty

Rationale Length: $t_i \rightarrow L_i = \exp(-\lambda_{length} * t_i/t_0), \lambda_{length}=0.001, t_0=200$



L_i

5. Importance-Weighted Aggregation

$w_i = (B_i^\alpha) * (F_i^\beta) * L_i, \alpha=1.0, \beta=1.0 \rightarrow \hat{a} = \text{argmax}_a \sum_{i:a_i=a} w_i$



Final Answer