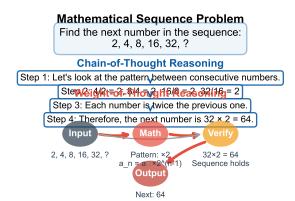
Case Studies: Detailed Reasoning Analysis

(a) Syllogistic Reasoning Case Study

Syllogistic Reasoning Problem All humans are mortal. All Greeks are humans. What can we conclude about Greeks? Chain-of-Thought Reasoning Step 1: All humans are mortal. Step 3: Therefore, all Greeks are mortal. All humans are mortal Mortal Therefore, all Greeks are mortal All Greeks are humans Greeks

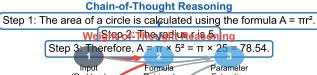
(b) Mathematical Sequence Case Study

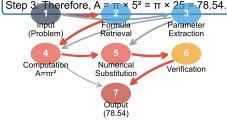


(c) Geometric Reasoning Case Study

Geometric Reasoning Problem

Find the area of a circle with radius 5.





(d) Algebraic Word Problem Case Study

Algebraic Word Problem John has 5 more apples than twice the number of oranges.

John has 5 more apples than twice the number of oranges If he has 27 apples, how many oranges does he have?

Chain-of-Thought Reasoning

Step 5: Therefore, 2x + 5 = 27. hges.

Step 6: Wetront 5 from both pidese 28 or 22 n twice the oranges.

Paraller Processing of Reasoning Components

(e) Comparative Analysis of Reasoning Capabilities

Reasoning Capability	Chain-of-Thought	Tree-of-Thought	Weight-of-Thought (Ours)
Sequential Processing			
Parallel Processing			
Information Integration			
Path Identification			
Error Recovery			
Weight-Guided Reasoning			
Adaptive Information Flow			
Multi-Modal Reasoning			
Legend: No Support	□□ Limited Support	☐ Partial Support ☐ F	Full Support