**Crypt Arithmetic Game**

**problem formulation**

**\*Initial state:** the equation in which variables are represented by symbols & operators are also encoded.

**\*Actions:** Each action involves decoding a symbol or a group of symbols to uncover the value of a variable.

**\*Transition Model:** When a symbol is decoded to reveal the value of a variable, the state is updated to reflect the new knowledge. The new value is substituted for the symbol in the equation, and the arithmetic operations are performed to simplify the equation.

**\*States:** The state of the problem is represented by the current state of the equation, including the encoded symbols and the values of the decoded variables.

**\*Path Cost**: Each step costs 1.

**\*Goal Test:** The goal is to find the values of the variables that make the equation true.