

## Featured Puzzle- March

### 1. Elvis Numbers.

Elvis is a rambunctious elf who likes to skip up stairs. Elvis likes to ponder about things while bouncing up the stairs so that this activity gets out both his physical and mental wiggles. On one occasion he thought about how many ways he could reach the top step. Elvis always starts on step 1 and although he has loads of energy his little legs restrict him from skipping more than one step at a time on his way up. He decided to call the number of ways he can run up a case of  $n$  stairs the  $n^{\text{th}}$  Elvis number and denote it by  $E_n$ .

Keeping in mind that he always starts on the first step and makes his way up either one or two steps at a time, find a formula for the value of  $E_n$ .

Hint: If you get stuck first figure out  $E_n$  for a few small values of  $n$  rather than trying to figure out the answer for a general number of steps.

**2. The Matchstick Game.**

Alice and Bob play the following game starting with a pile of 6 matchsticks: a player must take one or two matches from the pile of remaining matchsticks and the player who takes the last stick wins. If each player always makes the best possible move and Alice goes first who wins the game? What if there are originally 7 matchsticks in the pile, or 8 or any whole number  $n$ ?