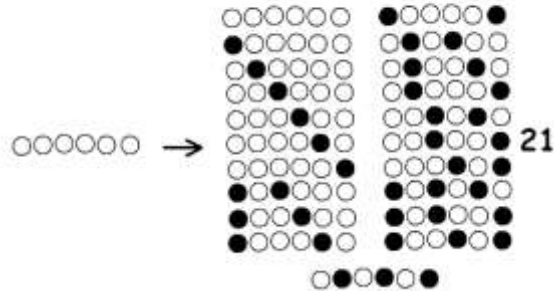
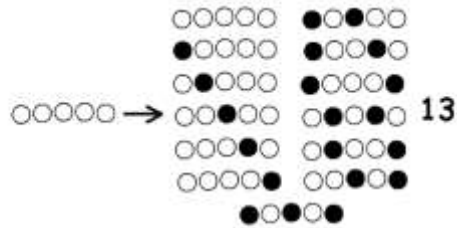


# WITHOUT WORDS

*Mathematical Puzzles to Confound and Delight*



## WW 25: SOLUTION



This puzzle counts the number of ways to colour dots in a row so that no two neighbouring dots are black. There are 13 ways to accomplish this task for a row of five dots and 21 ways for a row of six dots.

Let's be systematic with our thinking and consider colouring a row of five dots. If the first dot is set white, then we are left with the task of colouring the four remaining dots, which we know can be done in 8 ways. If we colour the first dot black, it must be followed by a white dot, leaving us with the task of colouring the three remaining dots, which can be done in 5 ways.

$$\begin{array}{c}
 \text{○|○○○○} \\
 \text{8 ways}
 \end{array}
 +
 \begin{array}{c}
 \text{●○|○○○} \\
 \text{5 ways}
 \end{array}
 = \text{13 ways}$$

Thus we see that the answer to any one puzzle equals the sum of answers of the two previous puzzles. This generates the sequence of answers:

2, 3, 5, 8, 13, 21, 34, 55, 89, 144, .....

These are the *Fibonacci numbers* and they have already appeared to us in WW19 and WW23.