

Tower of Hanoi

The *Tower of Hanoi* was invented by the French mathematician, Edouard Lucas, in 1883.

He was inspired by a tale of how a group of men were asked to transfer a stack of 64 gold disks from one of the three poles to another. They had to work with one restriction - a large disk could never be placed on top of a smaller one. If they could accomplish the feat, they could inherit the gold for their families.

If the men worked day and night, making one move every second, how long would it take them to accomplish the job?

(It would take them slightly more than 580 billion years to accomplish the job!)

What is the mathematics behind this?

How many moves would it take the men?

(The number of separate transfers of single disks the priests must make to transfer the tower is 18,446,744,073,709,551,615 moves!)

If you have a tower of 7 disks, can you calculate the number of moves it will take you to move the disks from one of the three poles to another?

What about 10 disks?

Would the number (even or odd) affect the number of moves?

Is there a general formula (nth formula) where you can use to calculate the number of moves for any number of disks?