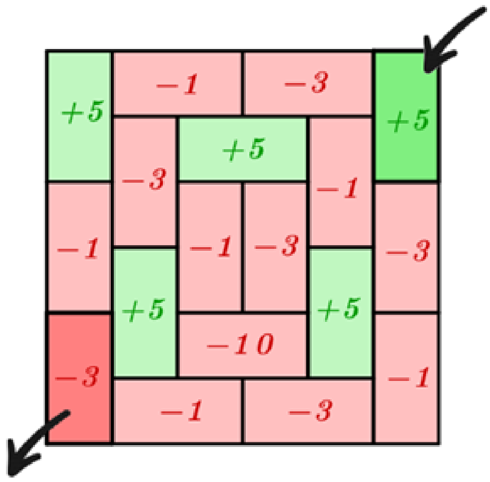
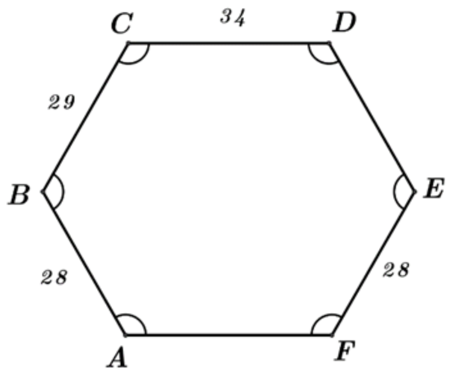
1. A positive integer is called **magical** if it consists of 4 digits and includes all of the digits from 1 to 4 exactly once. How many magical numbers are divisible by 11?

2. Positive integers a,b satisfy the equation $a + b = \frac{101}{a} + \frac{101}{b}$. Find the value of the expression $a + b + \frac{101}{a} + \frac{101}{b}$

3. Find the sum of all integers n for which the equation $x^2 - nx + 5n = 0$ has two distinct integer solutions.

4. In the figure, a map of a castle is given. Aladin is currently at the north-east corner and wishes to reach the south-west corner. There is a door between each pair of adjacent rooms. Golden coins are hidden inside rooms which are colored green on the map. The number of coins in such a room is shown on the map. When Aladin goes through a green room, he takes the coins at the room for himself. On the other hand, going through a red colored room costs money. Aladin is not allowed to enter a room that he has already been to before. What is the maximum amount of coins that Aladin can earn to himself?




5. A hexagon ABCDEF which all of its angles are equal to 120* is given. The sides AB=28, BC=29, CD=34, EF=28 are given as well. Determine the value of the product DE•FA.

6. A regular polygon has 2022 sides and is inscribed in a circle. A smaller circle with half the radius and with the same center as the first one, lies inside it. all chords of the bigger circle whose endpoints are at the vertices of the polygon and that are not tangent to the smaller circle, are constructed. By how many times the number of constructed chords which intersect the smaller circle is smaller than the number of chords which do not touch the smaller circle?