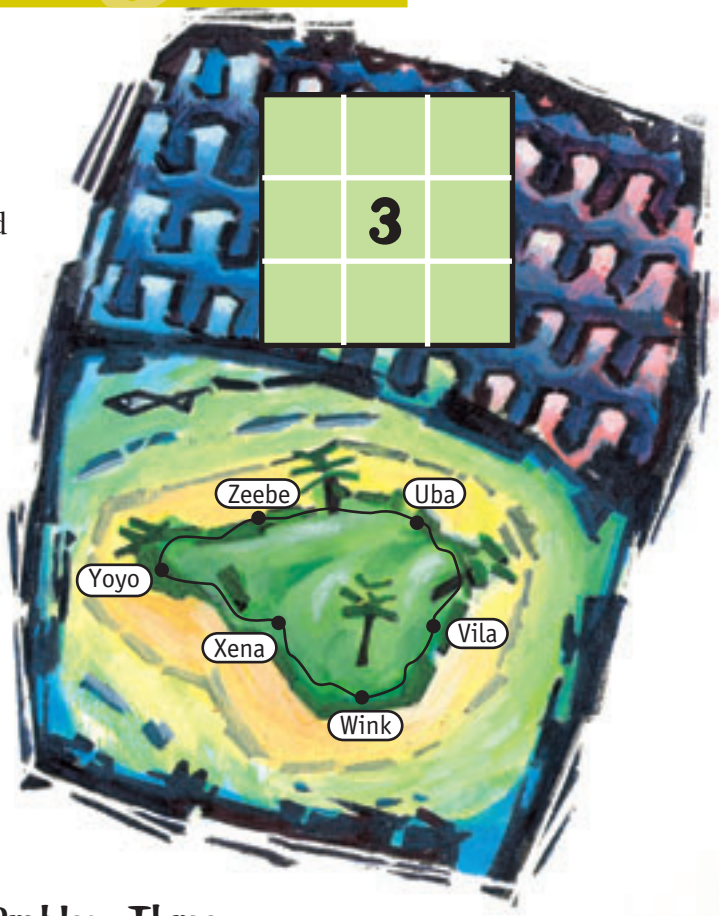
Going Around

Problem One

The numbers in each row, column, and diagonal of this magic square must add to 9. The 3 is fixed in the centre square. There is only one 1, and all the numbers are positive.

What numbers could be used in the spaces?



Problem Two

Each village on Circuit Island wants to be joined to each of the other villages by a separate track.

How many tracks will be needed to join all the villages to each other?

Problem Three

a. Some marbles in these jars must be moved into one of the other jars so that each jar has the same number of marbles in it.

How can this be done so that the smallest number of marbles is moved?

b. Now shift some marbles so that the red jar has two fewer marbles than the blue jar, which has two fewer than the yellow jar, which has two fewer than the green jar.

How many in each jar?

Problem Four

It takes 3 minutes to cook one side of a meat pattie and 2 minutes to cook the other side. The barbecue can hold only four patties at a time.

a. What is the least time needed to cook six patties?

b. What is the least time needed to cook 10 patties?