

THE BRIDGES

OF

KOENIGSBERG

The famous Swiss mathematician Leonhard Euler was visiting the city of Koenigsberg in Prussia in the year 1735. A favorite pastime for visitors to the city was to try to solve this puzzle:

"Can you cross each of the bridges of Koenigsberg exactly once?"

Mr. Euler was told by some people that it was impossible and others doubted whether or not it could be done. No one believed it was possible. Mr. Euler found a way to answer this question and settle everyone's doubts.

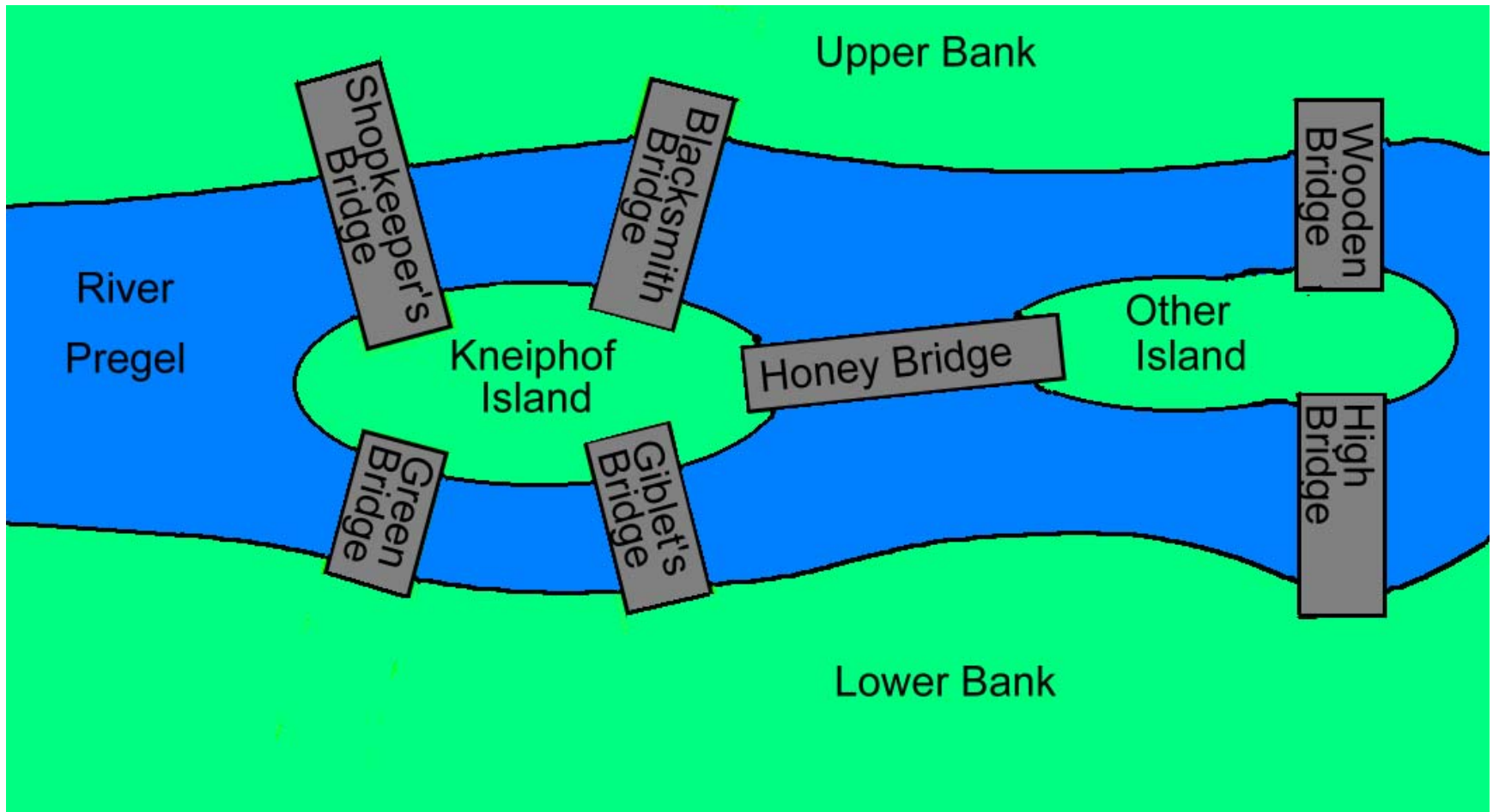


The geography:

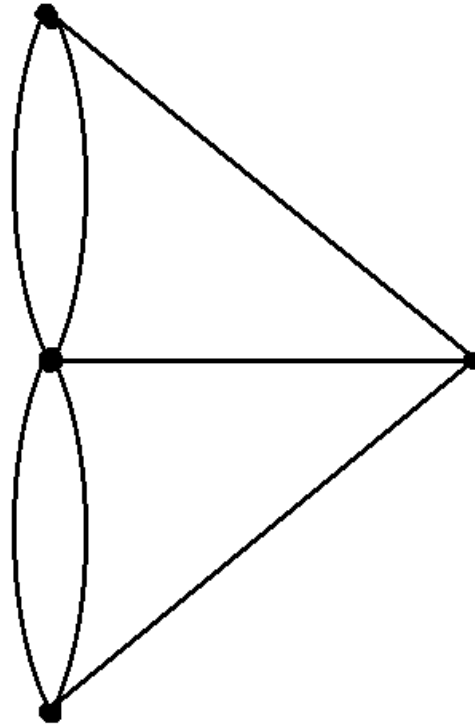
The river Pregel goes through the city of Koenigsberg. There are two islands in the middle of the river, with 7 bridges connecting the islands to each other and to the banks of the river.

(Today Koenigsberg is part of Russia and is renamed Kaliningrad)

Can you walk the 7 bridges of Koenigsberg, each exactly once?



This diagram can help you discover how Mr. Euler solved the problem once and for all.



Hint: Can you find a pattern in the numbers of bridges which lead to one of the four regions and whether or not you can walk the bridges?

Here are a few more things to try:

If the Shopkeeper's Bridge burned down, would you be able to walk all 6 remaining bridges exactly once?

If the Green Bridge burned down instead, would you be able to walk all 6 remaining bridges exactly once?

If you built a new bridge from the upper bank to Kneiphof Island, would you be able to walk all 8 bridges exactly once?