


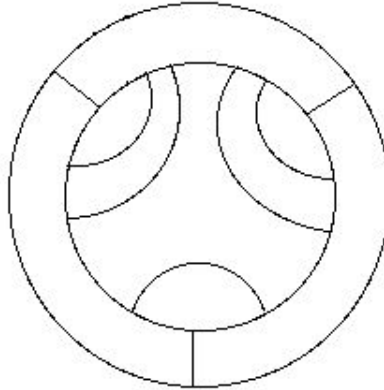
Rosen, Discrete Mathematics and Its Applications, 7th edition  
Extra Examples  
Section 10.8—Graph Coloring

 — Page references correspond to locations of Extra Examples icons in the textbook.

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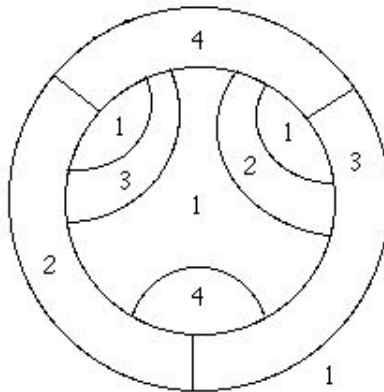
p.729, icon at Example 1

#1. Find the minimum number of colors needed to color the regions, including the infinite region, of the following map, so no adjacent regions have the same color.



**Solution:**

Four colors suffice, as shown in the following figure:



Note that three colors cannot be enough because the “center” region and the three regions that make up the outer ring are all adjacent to each other.

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