

1. The local chapter of the "I Love Smores" club has recently voted for their preferred doneness when roasting marshmallows. The three options were roasted to light brown (L), golden brown (G), or burnt (B). The 15 members each ranked their preferences. The results are illustrated in the table below. As president of the club, it is your responsibility to determine the winner. Come up with reasonable methods which allow you to declare each option the winner. That is, determine three different methods; one which results in light brown winning, one with golden brown winning, and one with burnt winning. Here, reasonable means that you must be able to explain and justify your method should a club member ask you.

| # of voters | 7 | 2 | 6 |
|-----------------|---|---|---|
| 1 st | L | G | B |
| 2 nd | G | B | G |
| 3 rd | B | L | L |

2. Over coffee, two mothers are discussing methods of getting their children to share. Julie, mother of twins John and Sara, explains that when John and Sara share a cookie, she lets one twin cut the cookie in two and the other choose the first piece. Julie explains that with this method, neither child complains about which piece they got. Leslie loves the idea, but doesn't know how to make it work for her triplets. Come up with a fair method for the triplets to share a cookie.

3. The organizers of a summer camp for girls have established a budget for the coming summer and have recruited, hired, and trained 15 camp counselors. Based on preregistration, they are now ready to assign counselors to groups of campers. Numbers of campers in each age group are listed in the table below. How many of the 15 counselors should be assigned to each age group of girls?

| Grade | Number of Preregistered Campers |
|-----------------|---------------------------------|
| 4 th | 42 |
| 5 th | 67 |
| 6 th | 81 |

4. The 18th-century town of Königsberg was built on both sides of the river Pregel River and on two islands in the river. The people of Königsberg entertained their Sunday strolls through town by trying to traverse the bridges in such a way that they crossed each of the town's seven bridges once and only once. Find such a route (you may begin anywhere in the town).

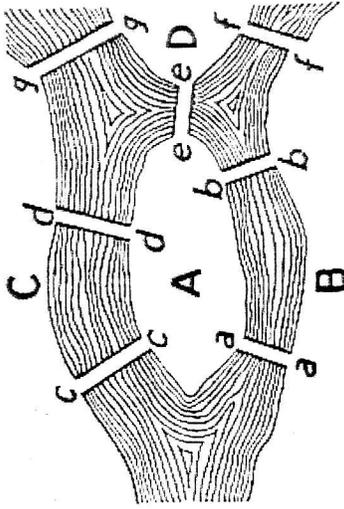


FIGURE 98. *Geographic Map: The Königsberg Bridges.*

5. A marketing class is assigned a project which requires the students to create and conduct a study to determine preferences of the UNL student body. Jack and Jill are friends and decide to work on similar projects. They write their survey together, but must conduct the study independently. Jack e-mails his survey to 100 UNL students that he selected from the student directory. Jill gave her survey to 250 students who were in the union during the noon hour on the Monday and Tuesday after the assignment was made. Afterward, Jack and Jill compare their results. Jack found that 52% of the students like the food served in the union. Jill found that about 87% of the students like the food in the union. Jack and Jill are worried that one of them has made a mistake. Explain to Jack and Jill how there can be such a difference in their results. Are you more likely to trust Jack's or Jill's results? Why?

6. On a game show, participants are given a choice to choose one of three doors. Behind one door is a car and behind the other two are goats. Imagine the participant chooses door 1. Then the game show host opens one of the remaining two doors, say door 2, to show a goat. The participant is then given the choice of keeping their guess of door 1 or switching to door 3. Which should the participant choose? Why?