1. Blood tests of 100 people showed that 45 had the A antigen and 14 had the B antigen. Another 45 had neither antigen, and so are of type O. How many people are of type AB, having both the A and B antigens? Draw and label a Venn diagram that shows the number of people with blood type A, B, AB, and O.

2. In a recent survey, the 60 students living in Harris Hall were asked about their enrollments in science, engineering, and humanities classes. The results were as follows:

24 are taking a science class
22 are taking an engineering class
17 are taking a humanities class
5 are taking both science and engineering classes
4 are taking both science and humanities classes
3 are taking both engineering and humanities classes
2 are taking classes in all three areas

a. How many students are not taking classes in any of the three areas?
b. How many students are taking a class in just one area?

3. Of the eighth graders at Paxson School, 7 played basketball, 9 played volleyball, 10 played soccer, 1 played basketball and volleyball only, 1 played basketball and soccer only, 2 played volleyball and soccer only, and 2 played volleyball, basketball, and soccer. How many played one or more of the three sports?

4. A pollster interviewed 500 university seniors who owned credit cards. She reported that 240 owned Goldcard, 290 had Supercard, and 270 had Thriftcard. Of those seniors, the report said that 80 owned a Goldcard and a Supercard, 70 owned a Goldcard and a Thriftcard, 60 owned a Supercard and a Thriftcard, and 50 owned all 3 cards. When the report was submitted for publication in the local campus newspaper, the editor refused to publish it, claiming the poll was not accurate. Was the editor right? Why or why not?
5. In Paul’s bicycle shop, 40 bicycles are inspected. If 20 needed new tires and 30 needed gear repairs, answer the following:

   a. What is the greatest number of bikes that could have needed both?
   b. What is the least number of bikes that could have needed both?
   c. What is the greatest number of bikes that could have needed neither?

6. Lewis Carroll Puzzle #1: Draw a Venn Diagram and answer the question.

   (1) All the old articles in this cupboard are creaked.
   (2) No jug in this cupboard is new.
   (3) Nothing in this cupboard, that is cracked, will hold water.

   Is there a jug in this cupboard that will hold water?

7. Lewis Carroll Puzzle #2: Draw a Venn Diagram and answer the question.

   (1) No birds, except ostriches, are 9 feet high;
   (2) There are no birds in this aviary that belong to anyone but me;
   (3) No ostrich lives on mince pies;
   (4) I have no birds less than 9 feet high.

   Do any birds in this aviary live on mince pies?