The Mystery Club at P.I. Middle School meets monthly. Members watch videos, discuss novels, play “whodunit” games, and talk about real-life mysteries. One day, a member announces that the school is having a contest. A teacher in disguise will appear for a few minutes at school each day for a week. Any student can pay $1 for a guess at the identity of the mystery teacher. The student with the first correct guess wins a prize.

The Mystery Club decides to enter the contest together. Each member brings a camera to school in hopes of getting a picture of the mystery teacher.

One of Daphne’s photos looks like the picture below. Daphne has a copy of the *P.I. Monthly* magazine is 10 inches high. She thinks she can use the magazine and the picture to estimate the teacher’s height.

- What do you think Daphne has in mind? Use the picture and the information about the height of the magazine to estimate the teacher’s height. Explain your reasoning.

- The teacher advisor to the Mystery Club says that the picture is similar to the actual scene. What do you suppose the adviser means by similar? Is it different from saying the two students in your class are similar?

Michelle, Daphne and Mukesh are the officers of the Mystery Club. Mukesh designs this flier to attract new members.

Daphne wants to make a large poster to publicize the next meeting. She wants to redraw the club’s logo, “Super Sleuth,” in a larger size. Michelle shows her a clever way to enlarge the figure by using a rubber band.
Use the rubber-band method to enlarge the figure on the Mystery Club flier. Draw the figure as carefully as you can, so you can compare the size and shape of the image to the size and shape of the original figure.

1. Describe how the original figure and the image are alike and how they are different. Compare these features:
   - the general shapes of the two figures
   - the lengths of the line segments in the hats and bodies
   - the areas of the hats and bodies
   - the perimeters of the hats and bodies
   - the angles in the hats and bodies

2. How are the original shape and its image alike?

3. How are the original shape and its image different?

4. Would your comparisons in part (1) change if the location of P were changed? Explain why or why not.