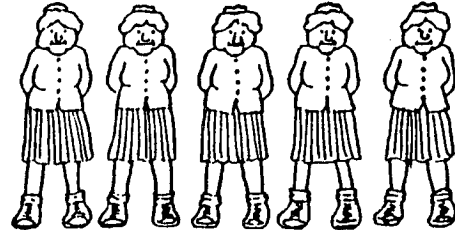# A Mathematical Tug-of-War

Your job in this mathematical contest is to decide who will win the final tug-of-war. The first two rounds give you the information you need.

The First Round. On one side there are four acrobats who have come down to the ground during the off-season for this special event. They have well-developed arm muscles because of all the swinging they do, and have proven themselves to be of equal strength. Remember that fact.

On the other side are five neighborhood grandmas, a tugging team that has practiced together for many, many years. They, too, are all equal in strength. Remember that fact also.

In the contest between these two teams, the result is dead even. Neither team can outtug the other. Remember that too.

The Second Round. One team is Ivan, the specially trained dog that got his start as a pup when he was taken out for a walk by his owner. Ivan gets pitted against a team made up of two of the grandmas and one acrobat.

Again, it's a draw—an equal pull. Remember that fact.

It's the final tug that you must figure out. It will be between these two teams: Ivan and three of the grandmas on one side, the four acrobats on the other. Can you figure out who will win this tug-of-war?

One way to solve this problem is to use algebra, a branch of mathematics that uses equations to deal with relationships between quantities. If you haven't learned about algebra yet, you'll have to rely on logical reasoning. Either way it's mathematical thinking you must do. Get a pencil and paper to help you tug on this problem.
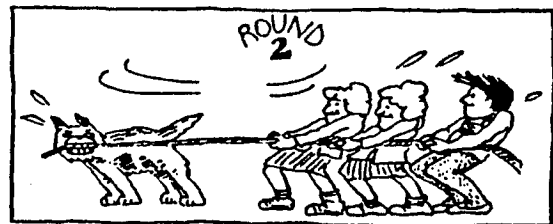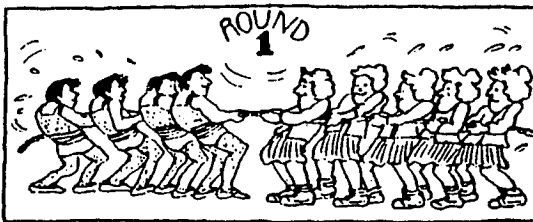
★ THE FINAL ROUND ★
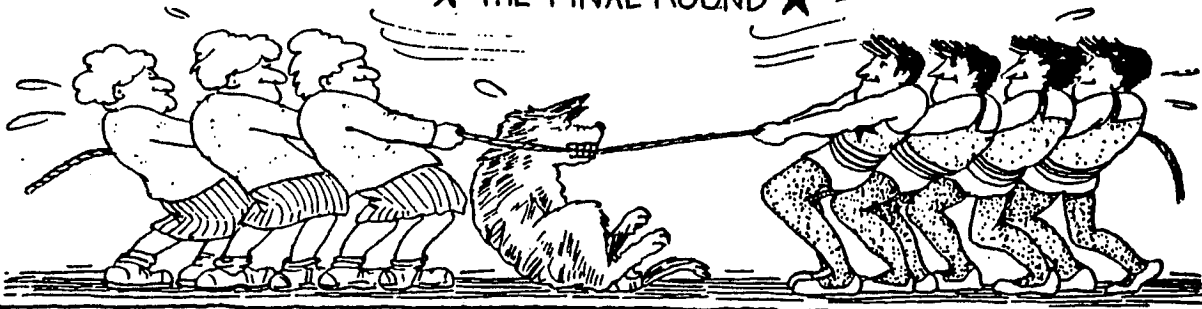
Bananas

1. How many bananas are needed to make the third scale balance? ✳ Explain your reasoning.

Tug of War

Four oxen are as strong as five horses.

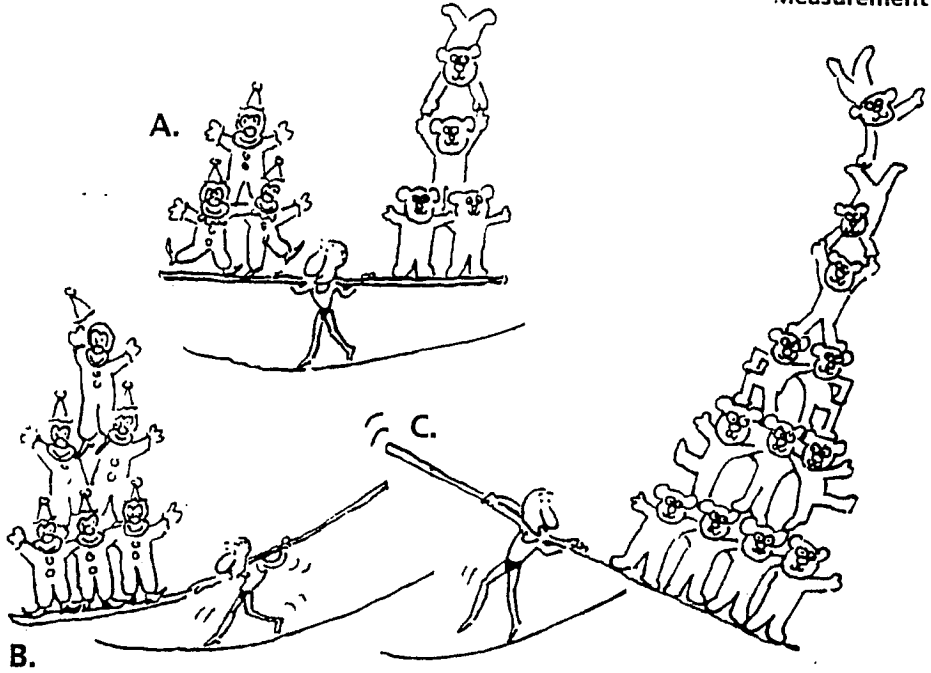An elephant is as strong as one ox and two horses.

2. Who will win the tug-of-war pictured below? Give a reason for your prediction.

A side   B side

8

Use cubes.

All the clowns working for Beacon and Bonkers Circus weigh exactly the same amount. All the circus bears also weigh the same as one another. Here is their high-wire balancing act. How can you add the proper number of bears and clowns to B and C so that they balance too?

A.

C.

B.

2