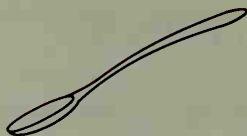




Orange



Teaspoon

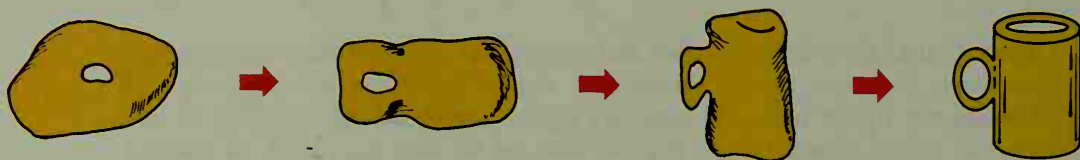


Brick

In fact, a doughnut is topologically equivalent to a coffee cup. (See the diagrams below.) For this reason, a topologist has been humorously described as a mathematician who can't tell the difference between a doughnut and a coffee cup!





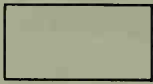



Think of the objects as made of modeling clay.

Push thumb into clay to make room for coffee.



## Exercises

In each exercise tell which figure is *not* topologically equivalent to the rest. Exercises 1 and 2 show plane figures.

1. a.  b.  c.  d. 
2. a.  b.  c.  d. 
3. a. solid ball      b. hollow ball      c. crayon      d. comb
4. a. saucer      b. house key      c. coffee cup      d. wedding ring
5. a. hammer      b. screwdriver      c. thimble      d. sewing needle
6. Group the block numbers shown into three groups such that the numbers in each group are topologically equivalent to each other.

0 1 2 3 4 5 6 7 8 9

7. Make a series of drawings showing that the items in each pair are topologically equivalent to each other.
  - a. a drinking glass and a dollar bill
  - b. a tack and a paper clip