

# Playsheet 16

## Not every issue has two sides

MATH 130-02

4/9/2009

**Directions:** Groups should consist of three or four people. Work together on each problem; do not delegate different problems to different people. Submit one **neatly written** write-up per group. Remember to use complete sentences as appropriate and explain your reasoning. That is, **show your work!**

1. Put a half twist in one of the strips of paper, then tape the ends together. The surface you get is called a **Möbius** strip.
2. With a red marker, color all along one edge of the strip. What do you notice? How many edges does the Möbius strip have?
3. With a blue marker, color down the middle of the strip until you close a loop. This is like coloring one side of the strip. What do you notice? How many side does the Möbius strip have?
4. Now cut down the blue line. This is similar to cutting the original strip of paper into two pieces. How many pieces do you end up with?
5. Cut down the middle of the strip again. Now what do you end up with?
6. Now make a new Möbius strip. Cut one-third of the way in from an edge all the way around. Stay one-third of the way from that edge until you come back to where you started cutting! What do you get?
7. Use a rectangle model to represent the Möbius strip. Draw three copies of it below.
  - (a) Put five points on the first copy of your model. Connect them all to each other without crossing any lines.
  - (b) Now put three blue points and three red points on your second copy of the model. Connect all of the reds to all of the blues without crossing any lines.
  - (c) On the third copy, reproduce number 6: trace along the rectangle one third of the way from the edge until you reach your starting point again. Use this to explain why number 6 worked out the way it did.