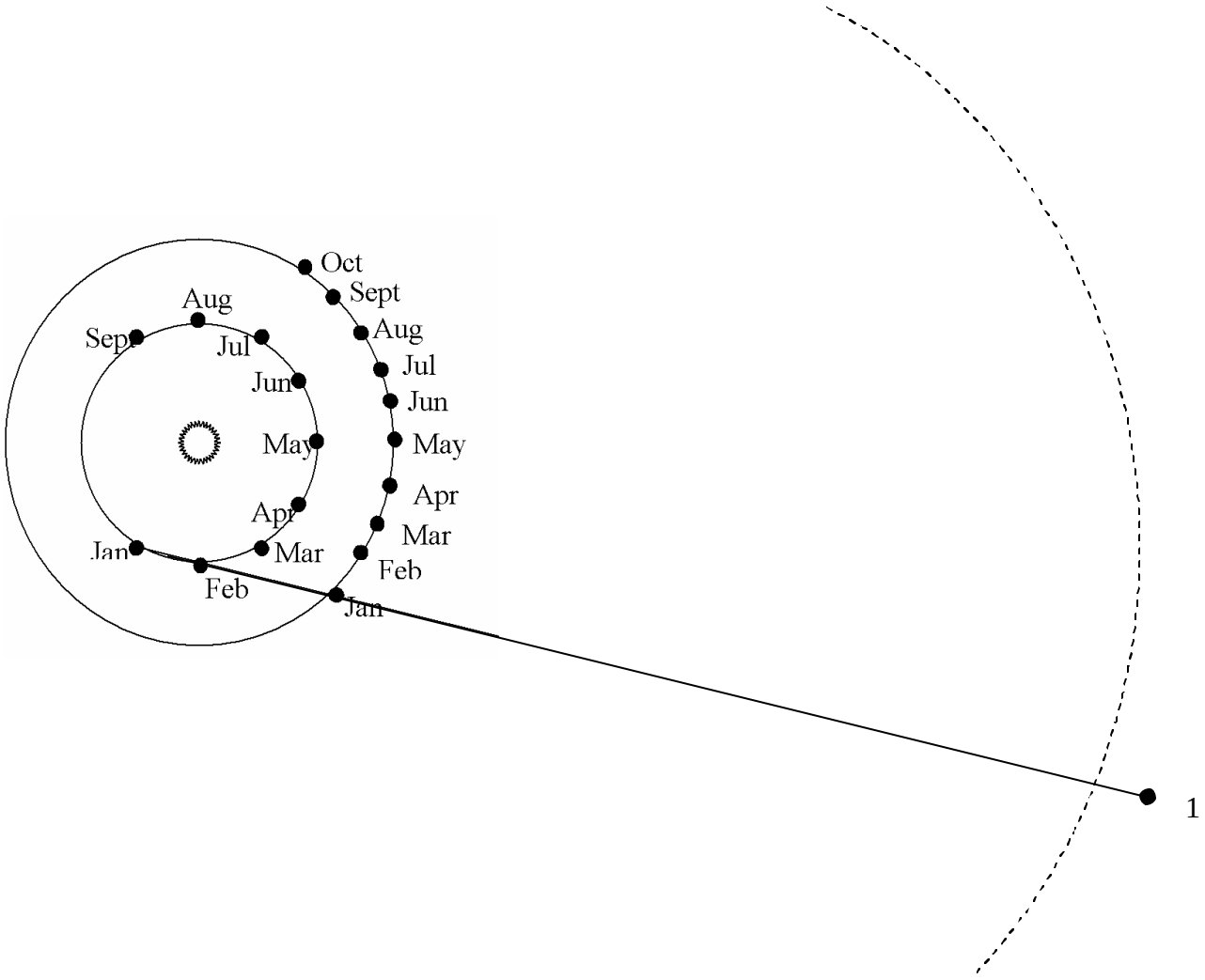
ACTIVITY- Retrograde Motion Name _____
"Backward" Motion of Planets

Planets tend to move across the sky in an easterly direction. Occasionally, something strange occurs. A planet appears to slow down and begin moving backward toward tht west. In this activity you are going to find out why this happens. The diagram below represents a part of our solar system. Earth and Mars are shown at several positions in their orbits around the sun. Each position is labeled with the name of the month when the planet will be located there.

Procedure

1. In the diagram below, draw a line from each Earth position through the Mars position for the same month. Extend the line approximately 1 cm past the dashed line. Place a dot at the end of the line and label the dots in order, with the dot on the January line being number 1, the dot on the February line being number 2, and so on. Note: If paths cross draw the lines slightly long and place the dots slightly farther away than you did for the other lines. Notice that the line for January is already drawn and the dot is labeled.
2. Using a pencil, start with the dot labeled "1" and carefully connect the dots in order (This line represents the path the planet Mars would follow in its orbit around the sun as seen from Earth. )



The dots that you put at the ends of the lines represent the positions where an observer on Earth would see Mars for the month indicated on the diagram. The line you drew connecting the dots represents the path Mars appears to follow.

Critical Thinking and Application

1. a. What movement does Mars actually experience from January through August?

b. To an observer on Earth, what movement does Mars appear to experience during that time period?

2. During which months does Mars appear to be moving backward in its orbit?

3. Carefully observe what is happening to Earth and Mars in their orbits when Mars seems to loop "backward." What causes Mars to seem to move backward in its orbit?

4. a. Do you think that to an observer on Earth all the planets visible in the night sky would appear at some point to go backward?

b. Explain your answer to question 4a.

5. Why would it be very difficult to observe Mercury and Venus to see if they experience such backward motion?