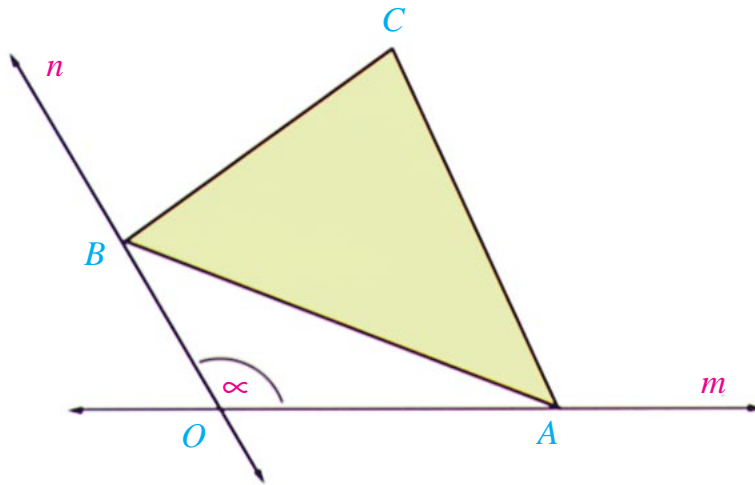


## The Moving Triangle

## Problem-of-the-Week

### The Problem

In a triangle  $ABC$ , vertices  $A$  and  $B$  move along two lines, line  $n$  and line  $m$ , respectively. Lines  $n$  and  $m$  intersect in angle  $\alpha$ , and angle  $\alpha$  remains constant. Find the locus of the third vertex,  $C$ .



### Strategies and Hints

1. Try to visualize the position of vertex  $C$  as the triangle moves. Is the locus of  $C$  more likely to be a curved path or a straight path?
2. Make a model of the triangle and trace it in several different positions.
3. Find the location of vertex  $C$  for some of the limiting positions of the triangle. For example, where is  $C$  when vertex  $A$  coincides with  $O$ ?
4. Draw the circumcircle for triangle  $BOA$ . Draw the diameter of this circle that passes through vertex  $C$ . Now construct the right triangle with right angle at  $O$  and the diameter as hypotenuse. What relationship does the right triangle have to the solution to the problem?