

Special Problem 1: Ant-Chase

Three ants move on a table-top. Initially, they are positioned at the vertices of an equilateral triangle with sides of length 1 cm. Ant A is attracted to Ant B, who is attracted to Ant C, who is attracted to Ant A. Each of the ants heads toward the ant of her choice, at a constant speed 1 cm/sec. The ants are quick in perception but not very smart. So at every moment, each ant is heading toward the instantaneous position of her target at that time.

- Do the ants ever meet?
- If so, how long does it take? (7)
- (Optional) What is the path they follow?
- (Optional) Write a little program to plot it.
- Generalize to 4 ants. (3)

Hint: If you use vectors and symmetry, no elaborate calculation is required (for the non-optional parts).