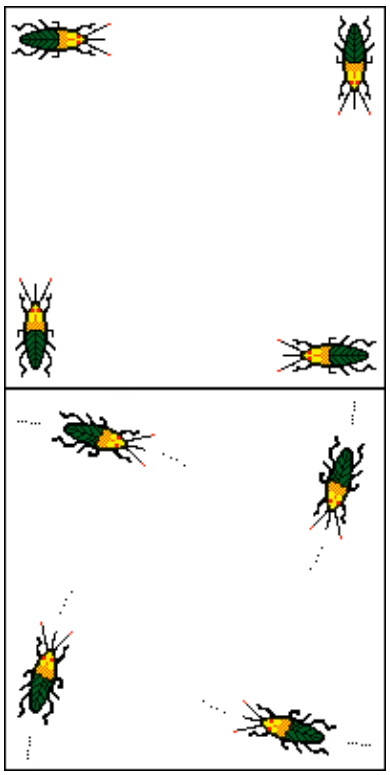
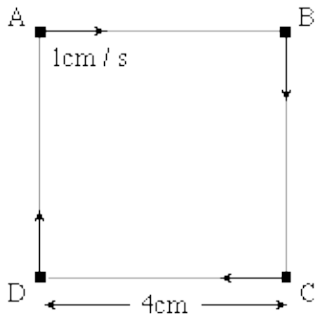
May 1997
Regulars

Puzzle No. 2 − carnivorous beetles

Four carnivorous beetles awake from a good night's rest feeling agreeably hungry. These beetles are not too particular about their diets and will always move directly towards their prey at a constant speed of 1 cm/sec. It just so happens that this morning the beetle at point A wakes up looking directly at B, who is looking at C, who is looking at D, who is looking at A. The points A, B, C and D are at the corners of a square of sides 4 cms.



All the beetles wake up at the same instant and start moving towards their prey. Clearly they will follow a curved path because their breakfast is on the move too!



Does A catch up with B, and if so:

1. How long does this take?
2. How far does A move in this time?
3. What happens?

We will publish the best solutions in the next issue, along with the answer to the problem itself. Please submit your answer, with explanation, to Any comments?

Solution

Plus is part of the family of activities in the Millennium Mathematics Project, which also includes the NRICH and MOTIVATE sites.