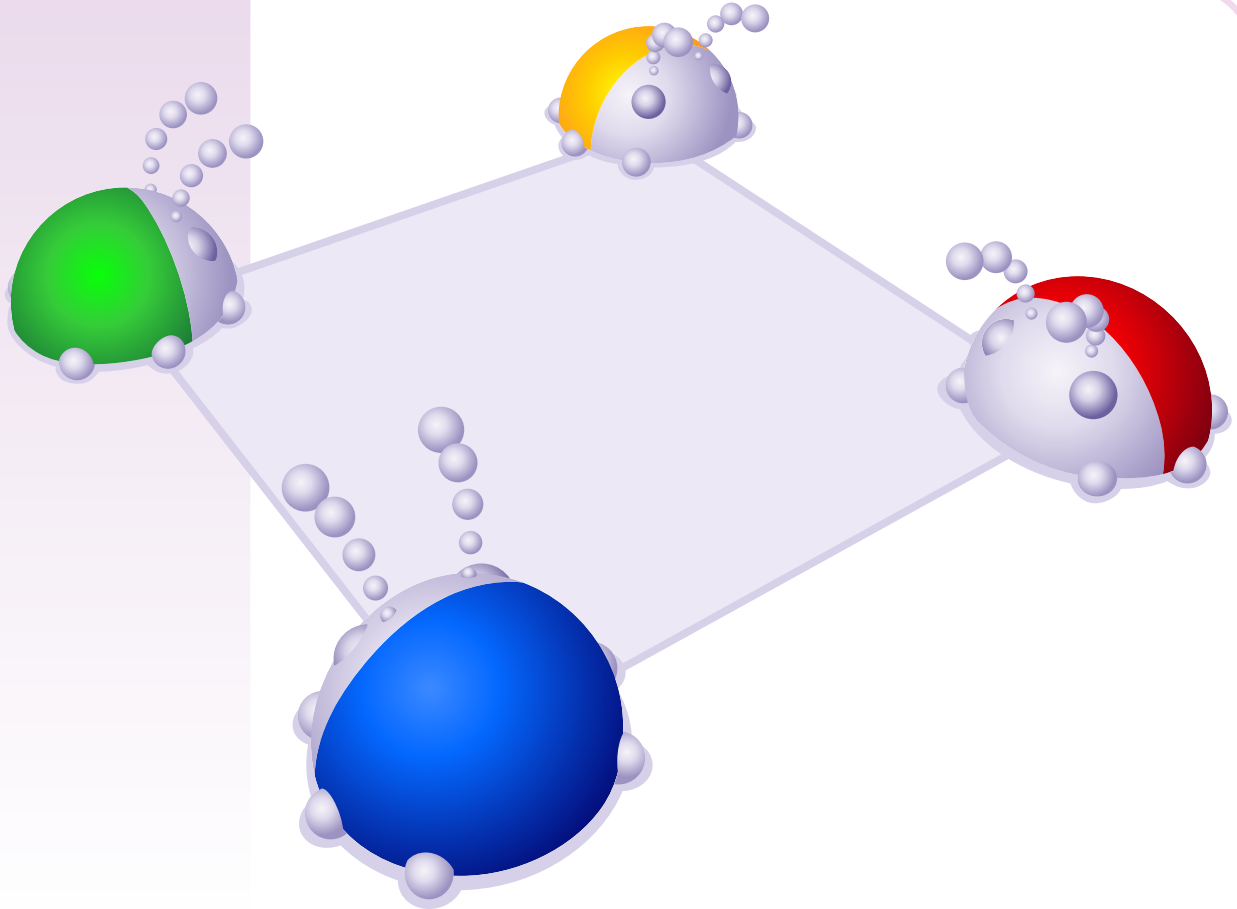


Treasure of Classic
and Modern Puzzles

Math 'n' Logic Puzzles



Bugs' Traffic *after Martin Gardner*

Four bugs, the Green, the Yellow, the Red, and the Blue occupy the corners of a square as shown in the illustration. The side of the square is 10 units long. Simultaneously the Green bug starts to crawl directly toward the Yellow one, the Yellow toward the Red, the Red toward the Blue and the Blue toward the Green.

Since all four bugs crawl at the same constant rate, they will describe four congruent logarithmic spirals which meet at the center of the square.

Thus the question is: how far does each bug travel before they meet?

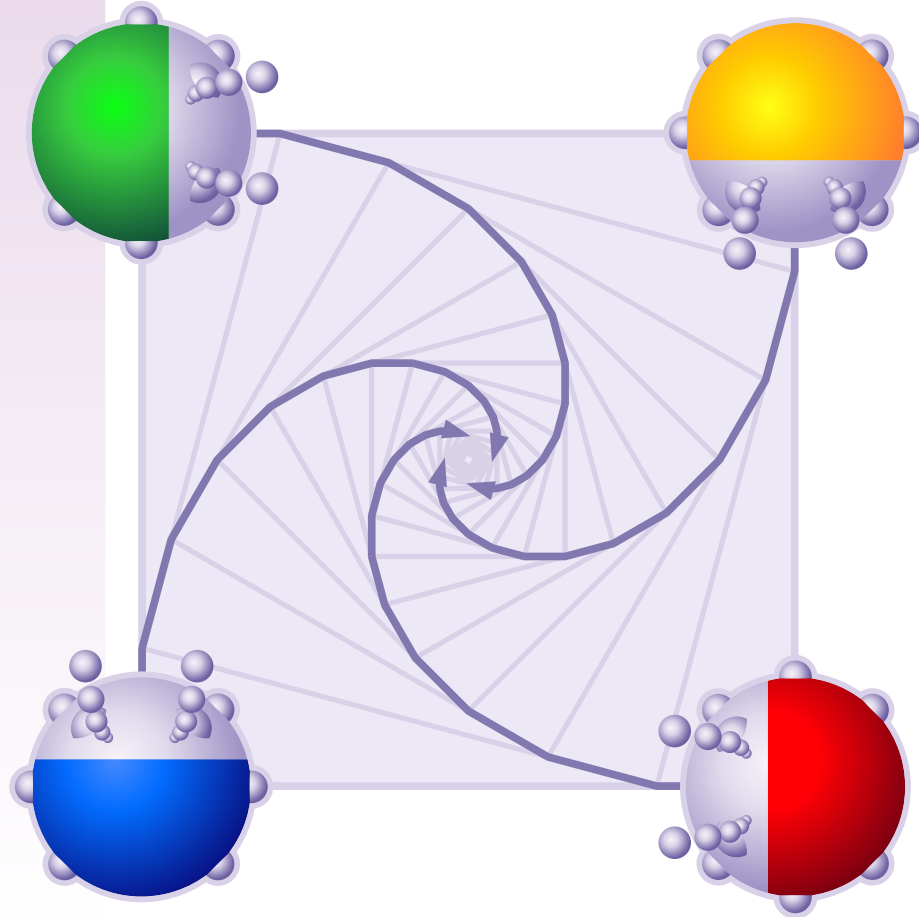
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Bugs' Traffic (solution)

At any given instant the four bugs form the corners of a square which shrinks and rotates as the bugs move closer together (see the illustration). The path of each pursuer will therefore at all times be perpendicular to the path of the pursued. This tells us that as the Green bug, for example, approaches the Yellow one, there is no component in the Yellow bug's motion which carries the Yellow toward or away from the Green. Consequently the Green will capture the Yellow in the same time that it would take if the Yellow had remained stationary. The length of each spiral path will be the same as the side of the square: 10 units.

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