

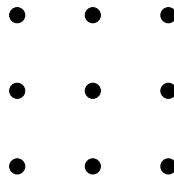
UW Math Circle
April 10, 2014
Homework

1. 15 squirrels worked together to gather 100 nuts. Show that some pair of squirrels gathered the same number of nuts.



2. Two volumes of William Shakespeare stand on a bookshelf next to each other: volume one, then volume two. Each volume is 4 cm thick (pages + two covers), and has two covers, each 0.5 cm thick. A bookworm starts on page 1 of volume one and munches his way in a straight horizontal line through to the last page of volume two. What distance does the worm travel?

3. Draw a broken line made of up four segments passing through all nine points in the figure below:



4. Is it possible to draw a closed 8-segment broken line which intersects each segment of itself exactly once?

5. A 10 by 10 table is filled in with positive integers so that adjacent integers (meaning their squares share a side) differ by 5 or less. Show that the table must contain two identical integers.
6. How can seven trees be planted such that there are six sets of exactly three trees in a straight line?