

### ALTERNATE REPRESENTATION

A bug sits on one corner of a unit cube and wishes to crawl to the diagonally opposite corner. If the bug must remain on the surface of the cube what is the length of a shortest path?

How many rectangles with lattice points as vertices are there contained in the rectangle with vertices  $(0,0)$ ,  $(n,0)$ ,  $(0,m)$  and  $(n,m)$ ?

$n$  points,  $n \geq 4$  are chosen on the circumference of a circle are chosen so that no three line segments joining pairs of points pass through the same point of the interior of the circle. Determine the number of interior intersections of the all the line segments joining pairs of points.

Among 18 people there are four who are acquaintances (mutually know each other) or else four who are strangers.