Elegant Elementary Mathematical Potpourri

We will survey some of my favorite accessible results from such diverse areas as number theory, geometry, calculus, geometric probability and mathematical billiards. Can you form a circular disc using similar copies of two subsets which partition a square? What is the probability that a line in the plane which strikes a bounded convex set A also strikes a disjoint second bounded convex set B? The answer can be elegantly given using rubber bands.