

## The converse of Pick's Theorem

Ralph Howard<sup>1</sup>

If  $P$  is a polygon in the plane such that its vertices are on the integer lattice, then Pick's Theorem states that its area is given by

$$\text{Area} = I + B/2 - 1$$

where  $I$  is the number of lattice points on the interior of  $P$  and  $B$  is the number of lattice points on the boundary of  $P$ . We look at the question "for what subsets is there a version of Pick's Theorem?" That is for what discrete subsets of the plane is there a formula for the area of polygons with vertices in the set depending only on the number of interior and boundary points from the set. This is joint work with Virginia Johnson of Columbia College.

<sup>1</sup>) University of South Carolina  
howard@math.sc.edu