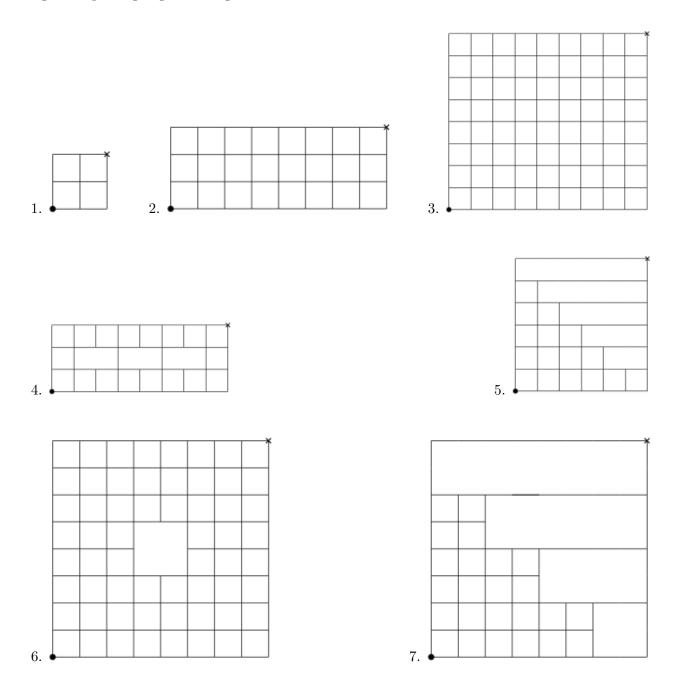
Western PA ARML January 17, 2021

## **Lattice Paths**

 $\begin{array}{c} {\rm JV~Practice~1/17/21} \\ {\rm C.J.~Argue} \end{array}$ 

## 1 Up-right paths

For each of the following grids, determine the number of paths from the  $\bullet$  to the  $\times$  that move either right or up along edges of the grid.



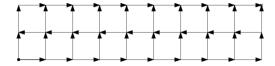
Western PA ARML January 17, 2021

## 2 Other paths

8. Determine the number of paths from the  $\bullet$  to the  $\times$  that move right, up, or diagonally up and right along edges of the grid.

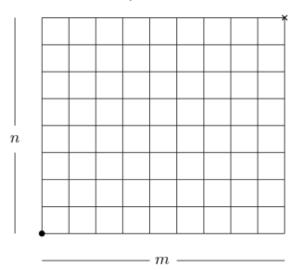


9. Determine the number of paths from the  $\bullet$  to the  $\times$  that move along grid edges only in the direction indicated by the arrow on each edge

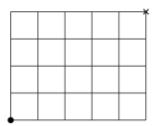


## 3 Challenge problems

1. For what m and n is it possible to travel from the  $\bullet$  to the  $\times$  along grid lines (using any direction) and visit each intersection exactly once?



2. Determine the number of paths from the • to the × that move along grid lines (using any direction) and visit each intersection exactly once.



3. Determine, in terms of n, the number of paths from the  $\bullet$  to the  $\times$  that move move right or up along edges of the grid, and do not go above the blue line.

