## Lattice Paths

JV Practice 1/17/21
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## 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.


3.

4.



## 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 $\bullet$ to the $\times$ 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.

