Let G be some $n \times m$ grid as in Figure 1, where each cell has two opposite diagonals connected (uniformly at random). Choose a cell (also uniformly at random), and consider the component that goes through this cell.

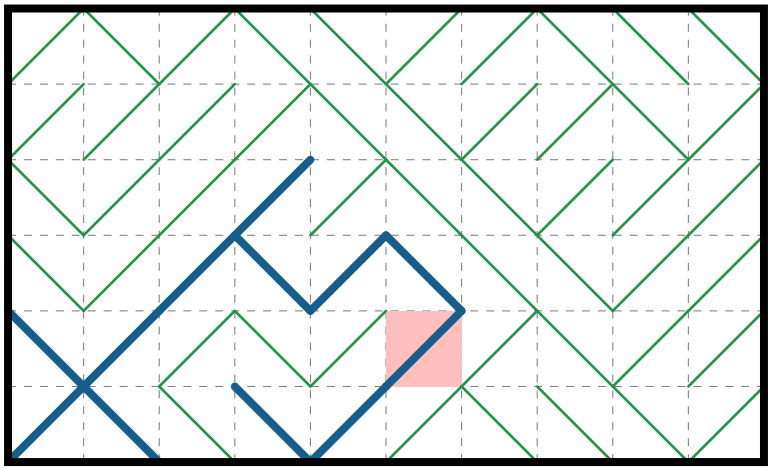

Figure 1: An example of a 6×10 grid, where a component of size 12 has been selected.

Question. What is the expected size of the selected component?

Related.

1. What is the expected number of components in an $n \times m$ grid?
2. How long is the longest component expected to be?
3. How does this change if the grid on a torus/cylinder/Möbius strip/etc?