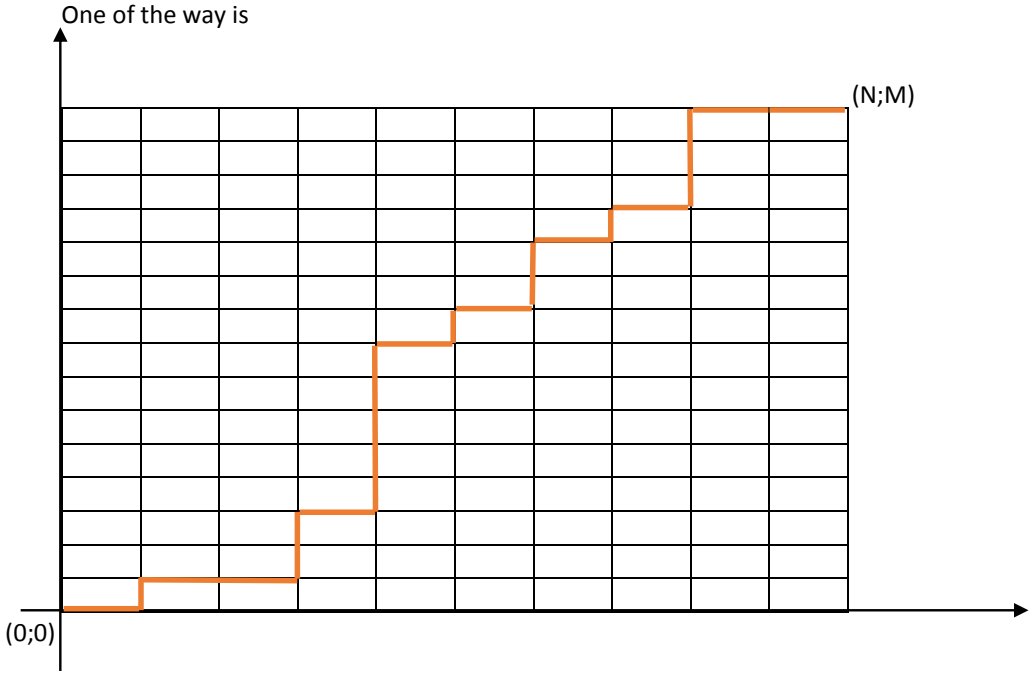
Answer on question 38563 – Math – Algorithms

One of the way is



To get to the point (N;M) from the point (0;0), we have to go at least N units to the right and M units up. If we go exactly N steps to the right and M steps up we get the shortest route and it is equal to M+N.

About the second question: How many different shortest routes are there?

We have to do N steps to the right and other up. How many different combinations to do this? It is equal to the number of ways to place the N steps to the right into N+M places. And it is equal to

$$A_{N+M}^{N} = A_{N+M}^{M} = (N+M)(N+M-1)\dots(M+1).$$

Answer: N+M; $(N+M)(N+M-1)\dots(M+1)$.