

Suppose that I am given a large supply of basic vectors:

$$b_1 = \begin{pmatrix} 2 \\ 1 \end{pmatrix} \text{ and } b_2 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

Starting at the origin, I take a 2-dimensional 'vector walk' where each step is either a b_1 vector or a b_2 vector, either forwards or backwards.

Investigate the possible coordinates for the end destinations of my walk.

Can you find any other pairs of basic vectors which yield exactly the same set of destinations?

Can you find any pairs of basic vectors which yield none of these destinations?