

In this problem we are given three grids of vectors. The vectors are only represented visually, but it is assumed that their x and y values are whole numbers (Remember: the x and y values represent the horizontal and vertical offsets from the start of the arrow, not the location of the start of the arrow itself).

Your task, in each case is to try to see which subsets of the vectors form closed loops (which means they have a vector sum of zero).

In each grid can you find a closed loop of vectors?

In each case is the closed loop unique? You can prove your assertions using algebra or a convincing visual argument.

