Magic(w)

1. If $V = \emptyset$ Then
   Return True
2. $v = \text{a vertex in } V \text{ with } \deg(v) \text{ maximal.}$
3. $V = V - v.$
4. Success = Label$(v, w)$
5. If Not Success Then
   Return False
   Else
   Success = Magic$(w)$
   Endif
6. If Not Success Then
   While Not Success and Next deg($v$) Permutation of $w$ Exists
   Success = Magic$(W)$
   Endwhile
7. Return Success

Figure 4 Algorithm Magic

Label$(v, w)$

1. If all edges of $v$ are labeled Then
   Sum = sum of label$(v, u_i)$ for all $i$
   If Sum $<> w$ Then
      Return False
   Else
      Return True
   Endif
   Endif
2. For each unassigned label$(v, u_i)$ assign labels as follows
   If edge$(v, u_i)$ is adjacent to a vertex of high degree, assign a small label to it
   Assign labels so that the sum of all labels = $w$
   If Assignment is successful Then
      Return True
   Else
      Return False

Figure 5 Algorithm Label$(v,w)$

The actual labeling of the edges is carried out in the Label algorithm, which is shown in Figure 5. If all the edges of the vertex to be labeled are already labeled and the sum of the labels is equal to $w$, the labeling of this vertex is complete (step 1). In this case, the edges of the current vertex have been labeled in the process of labeling the edges for the adjacent vertices. If, however, the sum is not equal to $w$, it is necessary to go back to the previous vertex and try another labeling of its edges (step 1). If there are still unlabeled edges for the current vertex, these edges are labeled so that the sum