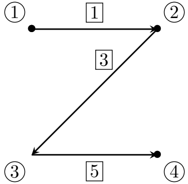
Row Space

Finally we consider the **row space**. We noted above that Row 2 and Row 4 were sums of the other rows in the matrix. This indicates linear dependence in the row space and we can throw such rows away when finding a basis of $C(A^T)$. But each row of A represents an edge! So what happens if we modify the graph by throwing these edges away? We get:



$\underbrace{\text{minimal}}_{\text{smallest \# edges}}$ $\underbrace{\text{spanning}}_{\text{contains all nodes}}$ $\underbrace{\text{tree}}_{\text{no loops}}$

> Each basis vector of the row space of the edge-node incident matrix represents one of the edges in a minimal spanning tree for the graph. This is the smallest simplification of the network (by removing redundant edges) that maintains its connectedness and flow pattern.