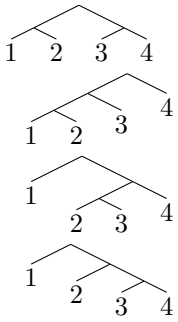
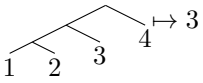
1 Trees With Labels



2 Trees Without Labels

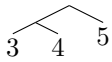
[just edit the previous diagrams]

3 Measuring Shape



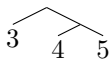
[edit it also for tree shape]

4 Ubiquity (1)



$$\begin{bmatrix} 0 & 1 & 0 & 0 & 1 \\ 1 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 \end{bmatrix}$$

5 Covariance

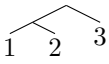


$$\begin{bmatrix} 0 & 1 & 1 & 0 & 0 \\ 1 & 0 & 0 & 1 & 1 \\ 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \end{bmatrix}$$

6 Ubiquity (2)

[the matrix would have 13 rows???]

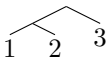
7 MRCA Algebra



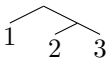
$$\begin{bmatrix} -1 & 0 & 1 \\ 0 & -1 & 1 \\ 1 & 1 & -2 \end{bmatrix}$$

$$\begin{bmatrix} -1 & 1 & 0 \\ 1 & -1 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

8 Covariance in MRCA Algebra



$$\begin{bmatrix} -(a+b) & a & b \\ a & -(a+b) & b \\ b & b & -2b \end{bmatrix}$$



$$\begin{bmatrix} -2b & b & b \\ b & -(a+b) & a \\ b & a & -(a+b) \end{bmatrix}$$

9 Commuting

$$\begin{bmatrix} -(a+b) & a & b \\ a & -(a+b) & b \\ b & b & -2b \end{bmatrix} \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & -1 \\ 1 & -2 & 0 \end{bmatrix} = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & -1 \\ 1 & -2 & 0 \end{bmatrix} \begin{bmatrix} 0 & 0 & 0 \\ 0 & -3b & 0 \\ 0 & 0 & -2a-b \end{bmatrix}$$

10 Eig Matrices

$$\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & -1 \\ 1 & -2 & 0 \end{bmatrix}$$

$$\begin{bmatrix} 0 & -3 & -1 \\ 0 & 0 & -2 \end{bmatrix}$$