Problem Set #1
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1.

(a) How many different such matrices exist for a graph with 4 vertices? **Answer:** $6 \cdot \binom{5}{2} = 60$

(b) How many different such matrices exist for a graph with 5 vertices? **Answer:** $\binom{10}{1}\binom{5}{2} = 20160$

(c) Can you write out a general formula for how many such matrices are for a graph with N vertices? **Answer:**

$$\prod_{i=1}^{N-2} \binom{T_{N-1} - (i-1)}{i}$$

Where T_n is the n-th triangle number.

2. let $\phi : \{1,2,3,4\} \to \{1,2,3,4\}$ be a remapping as follows:

$$\begin{array}{ccc} 1 & \mapsto & 1 \\ 2 & \mapsto & 4 \\ 3 & \mapsto & 3 \\ 4 & \mapsto & 2 \end{array}$$

That is, switch labels for (2) and (4).