Maths Discrètes
Solutions TP 7

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Exercice 1

$$\begin{aligned}\sum_{i=0}^{n}\sum_{j=0}^{i}\binom{n}{i}\binom{i}{j} &= \sum_{i=0}^{n}\binom{n}{i}\left(\sum_{j=0}^{i}\binom{i}{j}\right)\\ &= \sum_{i=0}^{n}\binom{n}{i}(1+1)^i\\ &= (2+1)^n\\ &= 3^n\end{aligned}$$

Exercice 2

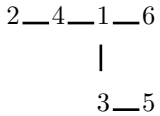
$$\begin{aligned}\sum_{i=0}^{n}\binom{n+1}{i+1}(i+1)2^i &= \sum_{i=0}^{n}(n+1)\frac{n!}{i!(n-i)!}2^i\\ &= (n+1)(2+1)^n\\ &= 3^n(n+1)\end{aligned}$$

Exercice 3

- $8, 2, 8, 2, 8, 2$
- $9, 4, 10, 13, 1, 10, 1, 10, 4, 8, 1, 13, 9$

Exercice 4

1.



2.

5—3—6—2—1—4—8
        |
        7

Exercice 5

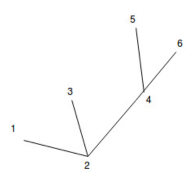
voir annexe.

Exercice 6

Algorithme pour Prüfer (Wikipédia les enfants!)

Exercice 7

INCOMPLET !
Vecteur de degré:



$\Rightarrow (1, 3, 1, 3, 1, 1)$

$$\sum_{i=0}^{n} d_i - 1 \Rightarrow n - 2$$

$$(n \times 1)^{n-2} = \sum ...$$