Maths Discrètes
Solutions TP 7

Grimau Romain

Exercice 1

$$\sum_{i=0}^{n}\sum_{j=0}^{i}\binom{n}{i}\binom{i}{j} = \sum_{i=0}^{n}\binom{n}{i}\left(\sum_{j=0}^{i}\binom{i}{j}\right)$$

$$= \sum_{i=0}^{n}\binom{n}{i}(1+1)^{i}$$

$$= (2+1)^{n}$$

$$= 3^{n}$$

Exercice 2

$$\sum_{i=0}^{n}\binom{n+1}{i+1}(i+1)2^{i} = \sum_{i=0}^{n}(n+1)\frac{n!}{i!(n-i)!}2^{i}$$

$$= (n+1)(2+1)^{n}$$

$$= 3^{n}(n+1)$$

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 — 4 — 1 — 6
        |
        3 — 5
```

2.

$$5\text{—}3\text{—}6\text{—}2\text{—}1\text{—}4\text{—}8$$
$$|$$
$$7$$

Exercice 5

voir annexe.

Exercice 6

Algorithme pour Prüfer (Wikipédia les enfants!)

Exercice 7

Exercice 8

Exercice 9

Exercice 10