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Spé Maths

Terminale

Combinatoire & Dénombrement



CORRIGÉ DE L'EXERCICE

CORRECTION

1. Rappelons la formule des coefficients binomiaux:

D'après le cours: $\binom{n}{k} = \frac{n!}{k!(n-k)!}$.

2. a. Calculons $\binom{4}{3}$:

$$\binom{4}{3} = \frac{4!}{3!(4-3)!} = \frac{4!}{3!(1!)} = \frac{4 \times 3!}{3! \times 1} = 4.$$

2. b. Calculons $\binom{7}{3}$:

$$\begin{aligned} \binom{7}{3} &= \frac{7!}{3!(7-3)!} = \frac{7!}{3!(4!)} = \frac{7 \times 6 \times 5 \times 4!}{3! \times (4!)} \\ &= \frac{7 \times 6 \times 5}{3 \times 2} \\ &= 35. \end{aligned}$$

2. c. Calculons $\binom{6}{3}$:

$$\begin{aligned}\binom{6}{3} &= \frac{6!}{3!(6-3)!} = \frac{6!}{3!(3!)} = \frac{6 \times 5 \times 4 \times 3!}{3! \times (3!)} \\ &= \frac{6 \times 5 \times 4}{3 \times 2} \\ &= 20.\end{aligned}$$

Au total: $\cdot \binom{4}{3} = 4$

$$\cdot \binom{7}{3} = 35$$

$$\cdot \binom{6}{3} = 20.$$