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Maths Complémentaires Terminale

Triangle de **Pascal**



CORRIGÉ DE L'EXERCICE

FACTORIELLE

1

CORRECTION

Simplifions les expressions suivantes:

On rappelle que pour $n \geq 0$: $n! = n \times (n-1) \times (n-2) \times \dots \times 2 \times 1$.

1. $\frac{6!}{3!}$?

$$\frac{6!}{3!} = \frac{6 \times 5 \times 4 \times 3!}{3!}$$

$$= 6 \times 5 \times 4$$

$$= 120.$$

Ainsi: $\frac{6!}{3!} = 120.$

2. $\frac{9!}{11!}$?

$$\frac{9!}{11!} = \frac{9!}{11 \times 10 \times 9!}$$

$$= \frac{1}{11 \times 10}$$

$$= \frac{1}{110}$$

Ainsi: $\frac{9!}{11!} = \frac{1}{110}$.

3. $\frac{20!}{3! \times 5! \times 2!}$?

$$\frac{20!}{3! \times 5! \times 2!} = \frac{20 \times 19 \times \dots \times 7 \times 6 \times 5!}{3! \times 5! \times 2!}$$

$$= \frac{20 \times 19 \times \dots \times 7 \times 6}{3! \times 2!}$$

$$= \frac{20 \times 19 \times \dots \times 7 \times 3!}{3! \times 2!}$$

$$= \frac{20 \times 19 \times \dots \times 7}{2}$$

Ainsi: $\frac{20!}{3! \times 5! \times 2!} = \frac{20 \times 19 \times \dots \times 7}{2}$.