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Spé Maths

Terminale

Exponentielle $\exp(x)$



CORRIGÉ DE L'EXERCICE

CORRECTION

Simplifions au maximum les expressions suivantes:

1. $x^a + x^b$:

Malheureusement cette expression ne peut pas être simplifiée.

D'où: $x^a + x^b = x^a + x^b$.

2. $x^a \times x^b$:

$$x^a \times x^b = x^{(a+b)}$$

D'où: $x^a \times x^b = x^{(a+b)}$.

3. $\frac{x^a}{x^b}$:

$$\frac{x^a}{x^b} = x^{a-b}$$

D'où: $\frac{x^a}{x^b} = x^{a-b}$.

4. $\frac{x^0 \times x^9}{3 \times x^7}$:

$$\frac{x^0 \times x^9}{3 \times x^7} = \frac{x^{(0+9)}}{3 \times x^7} = \frac{1}{3} \times x^{(0+9)} \times x^{(-7)}.$$

$$\text{D'où: } \frac{x^0 \times x^9}{3 \times x^7} = \frac{1}{3} \times x^{(9)} \times x^{(-7)} = \frac{1}{3} \times x^{(9-7)} = \frac{1}{3} x^2.$$

$$5. \frac{x^{-6} \times x^7 \times x}{x^9 \times (x^3)^n}.$$

$$\frac{x^{-6} \times x^7 \times x}{x^9 \times (x^3)^n} = \frac{x^{(-6+7+1)}}{x^9 \times x^{3n}} = \frac{x^{(-6+7+1)}}{x^{(9+3n)}} = x^{(-6+7+1)} \times x^{(-9-3n)}.$$

$$\text{D'où: } \frac{x^{-6} \times x^7 \times x}{x^9 \times (x^3)^n} = x^{(2)} \times x^{(-3n-9)} = x^{(2-3n-9)} = x^{(-3n-7)}.$$

$$6. \frac{x^2 \times x^{-9} \times (x^n)^9 \times x^{51}}{x^{64} \times (x^n)^3}.$$

$$\frac{x^2 \times x^{-9} \times (x^n)^9 \times x^{51}}{x^{64} \times (x^n)^3} = \frac{x^2 \times x^{-9} \times x^{9n} \times x^{51}}{x^{64} \times x^{3n}} = \frac{x^{(2-9+9n+51)}}{x^{(64+3n)}} = x^{(2-9+9n+51)} \times x^{(-64-3n)}.$$

$$\text{D'où: } \frac{x^2 \times x^{-9} \times (x^n)^9 \times x^{51}}{x^{64} \times (x^n)^3} = x^{(9n+44)} \times x^{(-3n-64)} = x^{(9n+44-3n-64)} = x^{(6n-20)}.$$

$$7. \frac{x^{-8} \times (x^{-8})^n \times (x^n)^{-8}}{x^{-5} \times x^4 \times x^0}.$$

$$\frac{x^{-8} \times (x^{-8})^n \times (x^n)^{-8}}{x^{-5} \times x^4 \times x^0} = \frac{x^{-8} \times x^{-8n} \times x^{-8n}}{x^{-5} \times x^4 \times x^0} = \frac{x^{(-8-8n-8n)}}{x^{(-5+4+0)}} = x^{(-8-8n-8n)} \times x^{(5-4-0)}.$$

$$\text{D'où: } \frac{x^{-8} \times (x^{-8})^n \times (x^n)^{-8}}{x^{-5} \times x^4 \times x^0} = x^{(-16n-8)} \times x^{(1)} = x^{(-16n-8+1)} = x^{(-16n-7)}.$$