

Degré d'un polynôme

$p(x) = a_n x^n + a_{n-1} x^{n-1} + \dots + a_1 x + a_0$; polynôme
 $a_0, a_1, \dots, a_n$: coefficients. x : variable.
 $a_i x^i$; i ème terme du polynôme
 $d^0(p(x)) = n$; degré du polynôme. $n \in \{1, 2, \dots\}$.

$p(x_1, \dots, x_n) = \sum_{i_1, \dots, i_n} a_{i_1, \dots, i_n} x_1^{i_1} x_2^{i_2} \dots x_n^{i_n}$.
 $d^0(a_{i_1, \dots, i_n} x_1^{i_1} x_2^{i_2} \dots x_n^{i_n}) = i_1 + \dots + i_n$.
 $d^0(p(x_1, \dots, x_n)) = \max_{i_1, \dots, i_n} (i_1 + \dots + i_n)$.

⑤ $p(x, y, z) = \underbrace{(7x + 4y^2 + z^5)}_{d^0=1} \underbrace{(-5x^3 z^4 y^7 + y^4)}_{d^0=18} + \underbrace{x^7}_{d^0=7} \underbrace{- 7y^4 x^7}_{d^0=11} - \underbrace{5y^7}_{d^0=7}$

$d^0(7x \cdot (-5x^3 z^4 y^7)) = 1 + 18 = 19$;

$d^0(4y^2(-5x^3 z^4 y^7)) = 2 + 18 = 20$.

① $p(x) = x^7 - 5x^3 + x^2 + x + 7 = a_0 = a_0 x^0$
 $d^0(p(x)) = 0$.

② $p(x) = -5x^3 \rightarrow d^0(p(x)) = 3$.

③ $p(x, y) = x^7 - 5y^7$
 $d^0(x^7) = 7$ $d^0(-5y^7) = 7$.
 $d^0(p(x, y)) = 7$.

④ $p(x, y) = \underbrace{x^7}_{d^0=7} - \underbrace{7y^4 x^7}_{d^0=11} - \underbrace{5y^7}_{d^0=7}$.

$d^0(-7y^4 x^7) = 4 + 7 = 11$

$d^0(p(x, y)) = 11$.

$d^0(-5x^3 z^4 y^7) = 7 + 4 + 7 = 18$

$d^0(z^5(-5x^3 z^4 y^7)) = 18 + 5 = 23$.
 $= d^0(p(x, y, z))$.