

Exercises

E16.39 [1FG] Let $a = 0$ for simplicity. Rewrite the following relations, and prove them.

- If $n \geq m \geq 1$ then

$$O(x^n) + O(x^m) = O(x^m), \quad o(x^n) + O(x^m) = O(x^m), \quad x^n +$$

- If $n > m \geq 1$ then

$$O(x^n) + o(x^m) = o(x^m), \quad x^n + o(x^m) = o(x^m).$$

- For $n, m \geq 1$

$$x^n O(x^m) = O(x^{n+m})$$

$$x^n o(x^m) = o(x^{n+m})$$

$$O(x^n) O(x^m) = O(x^{n+m})$$

$$o(x^n) O(x^m) = o(x^{n+m})$$

•

$$\int_0^y O(x^n) \, dx = O(y^{n+1}) \quad \int_0^y o(x^n) \, dx = o(y^{n+1}) \quad .$$