Definition 11.51. [124]*For $A, B \subseteq X$ arbitrary subsets, we recall the definition of* Minkowski sum $A \oplus B = \{x + y : x \in A, y \in B\}$ *defined in* [11R].
Having now fixed a set B, we define

- *the* ***dilation*** *of a set $A \subseteq X$ to be $A \oplus B$;*
- *the* ***erosion*** *of a set $A \subseteq X$ as*

$$A \ominus B = \{z \in X : (B + z) \subseteq A\} \quad ;$$

- *the* ***closing*** $A \bullet B = (A \oplus B) \ominus B$;
- *the* ***opening*** $A \circ B = (A \ominus B) \oplus B$.

Where, given $B \subseteq X, z \in X$, we have indicated with $B + z = \{b + z : b \in B\}$ the translation of B in the direction z. In previous operations B it is known as "structural element", And in applications often B it's a puck or a ball.