Let $R$ be a commutative ring and $I$ an ideal of $R$. When we write \((I + a) \cdot (I + b) = I + a \cdot b\) the multiplication symbol \(\cdot\) is overloaded in that it means two different things in the two uses.

When we write \((I + a) \cdot (I + b)\), what does \(\cdot\) mean?

When we write \(I + a \cdot b\) what does \(\cdot\) mean?