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extended ideal

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Let $f : A \rightarrow B$ be a ring map. We can look at the ideal generated by the image of \mathfrak{a} , which is called an *extended ideal* and is denoted by \mathfrak{a}^e .

It is not true in general that if \mathfrak{a} is an ideal in A , the image of \mathfrak{a} under f will be an ideal in B . (For example, consider the embedding $f : \mathbb{Z} \rightarrow \mathbb{Q}$. The image of the ideal $(2) \subset \mathbb{Z}$ is *not* an ideal in \mathbb{Q} , since the only ideals in \mathbb{Q} are $\{0\}$ and all of \mathbb{Q} .)