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essential submodule

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Let X be a submodule of a module Y . We say that X is an *essential submodule* of Y , and that Y is an *essential extension* of X , if whenever A is a nonzero submodule of Y , then $A \cap X$ is also nonzero.

A monomorphism $f : X \rightarrow Y$ is an *essential monomorphism* if the image $\text{im} f$ is an essential submodule of Y .