

Derived Category

1 Construction

Definition 1 (Derived category). Let \mathbf{A} be an abelian category. The *derived category* $D(\mathbf{A})$ is defined by the following universal property: for any $\mathcal{H}om \mathcal{H}om$
 $Ext \ell \ a b c d \ p \ k \ k \ . \quad \mathfrak{A}, \ A B C D E F G H I J K L M N O P Q R S T U V W X Y Z$
 $a b c d e f g h i j k l m n o p q r s t u v w x y z \quad \mathfrak{A} B C D E F G H I J K L M N O P Q R S T U V W X Y Z.$
 $a b c d e f g h i j k l m n o p q r s t u v w x y z \quad A B C D E F G H I J K L M N O P Q R S T U V W X Y Z$
 $a b c d e f g h i j k l m n o p q r s t u v w x y z \quad A B C D E F G H I J K L M N O P Q R S T U V W X Y Z$
 $a b c d e f g h i j k l m n o p q r s t u v w x y z. \ 1$

Example 2 (Test of manually defined mathtools commands). Here we test the commands we defined manually:

The function is defined as:

$$f(x) := \begin{cases} x^2 & \text{if } x \geq 0 \\ -x^2 & \text{if } x < 0 \\ 0 & \text{otherwise} \end{cases}$$

This shows that both `\coloneqq` and the `dcases` environment work correctly without mathtools.