An Introduction to Category Theory

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Introduction

One of math's most abstract fields: Category Theory arose from the habit of representing relations as diagrams on blackboards. While it's origins might be in the corporeal world of chalkboards and erasers, Category Theory is a field of mathematics that extends the abstract study of mathematics as form and relation over the applied use of mathematics as calculation.

1 Objects and Arrows

Fundamental to Category Theory are categories. Arrows can be and usually are functions. Objects can be and usually are sets.

Definition 1. A category consists of

1. A class of Objects ob(c)
2. A class mor(C) of arrows
3. A source
4. A target

Example 1. Use the Monoid A(Z, +) here.

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Definition 2. Lorem ipsum dolor sit amet, consectetur adipisci tempor incidunt ut labore et dolore magna aliqua veniam, quis nostrud exercitation ullamcorpor s commodo consequat.

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Theorem 1. *Duis autem vel eum irrure esse molestiae consequat, vel illum dolore eu fugi et iusto odio dignissim qui blandit praesent luptat exceptur sint occaecat cupiditat non provident, deserunt mollit anim id est laborum et dolor fuga distinct.*

2 Functors and Natural Transformations

Applying Theorem 1 to Definition 2, it follows that ipsum. This was previously established in [**?**] and [**?**, **?**].

Theorem 2. *X is a functor*

Proof. Proof that X is a functor □