Single-variable calculus has two parts:

- *Derivatives* and applications
- *Integrals* and applications

Multivariable calculus is the same, but functions are weirder.

Single variable functions map a single real variable to a single real value:

$$f\colon \mathbb{R} \to \mathbb{R}.$$

Multivariable, *real-valued* functions eat multiple things and spit out a single thing:

$$f\colon \mathbb{R}^n \to \mathbb{R}.$$

Single variable, *multi-valued* functions eat a single thing and spit out multiple things:

$$f\colon \mathbb{R} \to \mathbb{R}^m.$$

Multivariable, *multi-valued* functions east many things and spit out many things:

$$f\colon \mathbb{R}^n \to \mathbb{R}^m.$$