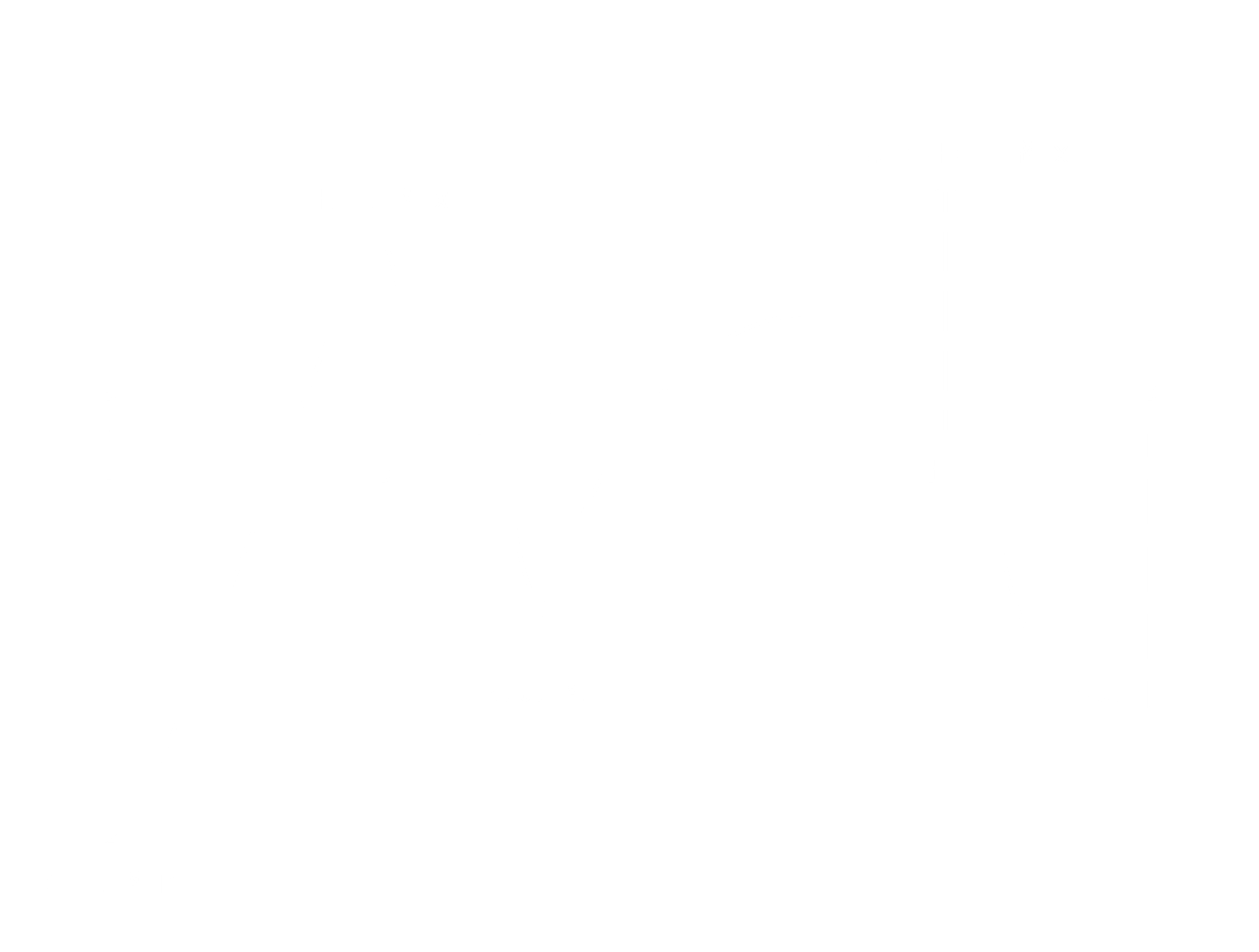
**Extrema Functions of Two Variables**

## Absolute and Relative Extrema

For a function , suppose we consider some **closed bounded region** , from to . The extrema values **within this region** are called the **relative**, or **local** extrema.

The **largest value** amongst all relative extrema is called the **absolute** or **global** extrema.



Note: The above image is for single variables, since this is easier to understand. For multiple variables, we deal with regions, not curves.

As can be seen in the graph above, for **absolute extrema**, it is not necessary that the point be a **critical point**. It is also possible for it to occur at a **boundary point**. Thus, we need to check both. However, **relative extrema** can only occur at **critical points**.

A point is a **critical point** if:

1. and or
2. or does not exist.