

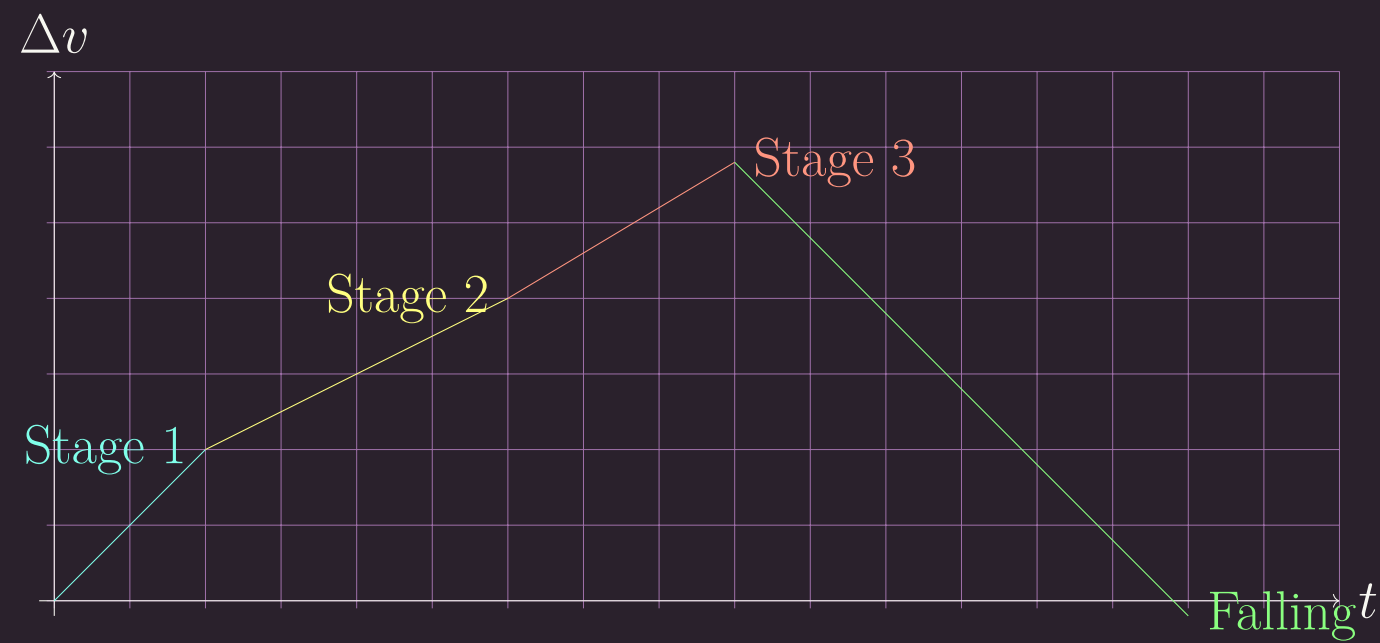
Types of Functions

Piecewise Functions

Notation

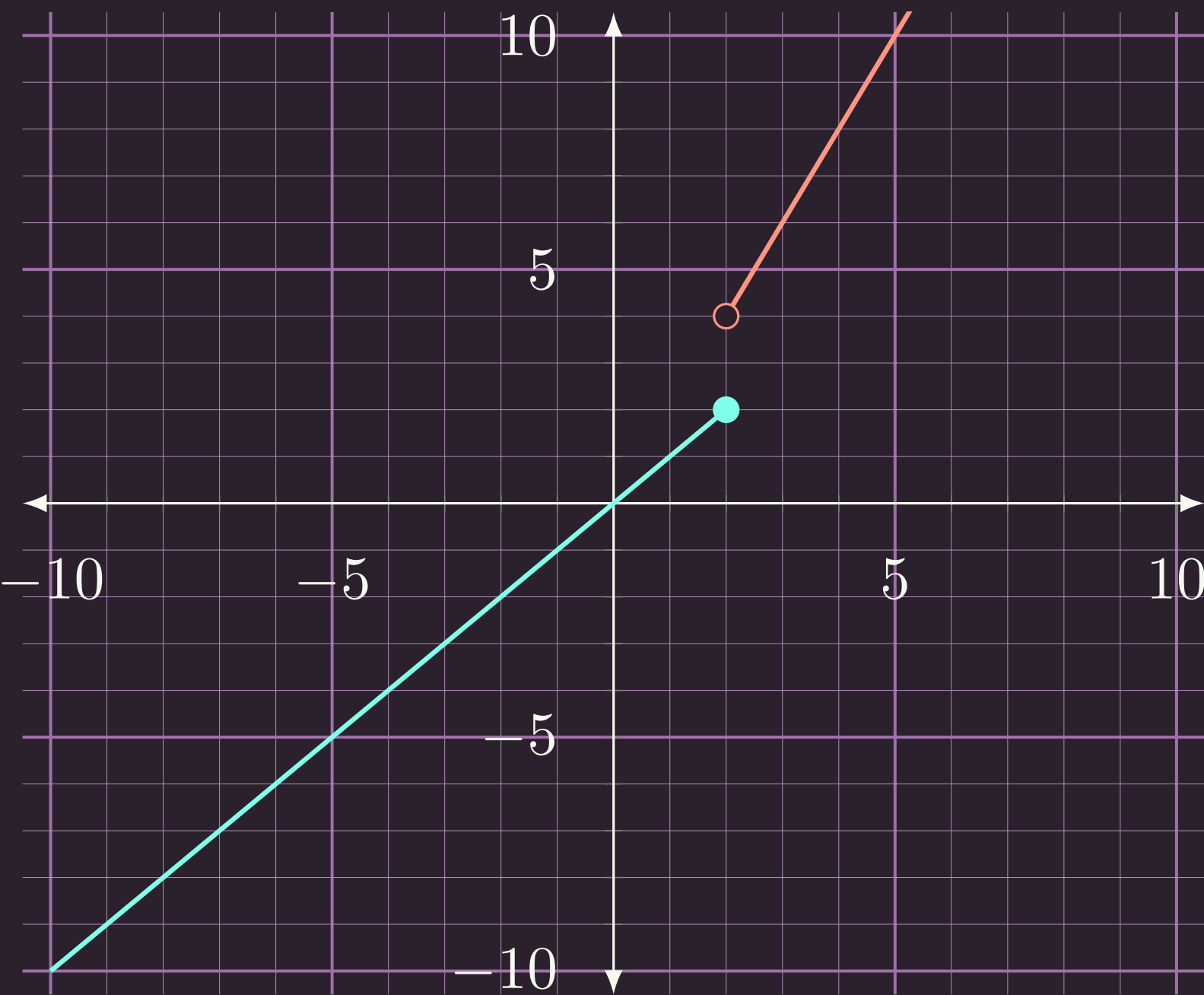
$$f(x) = \begin{cases} \text{function,} & \text{condition} \\ \vdots & \vdots \\ \text{function,} & \text{condition} \end{cases}$$

Example:



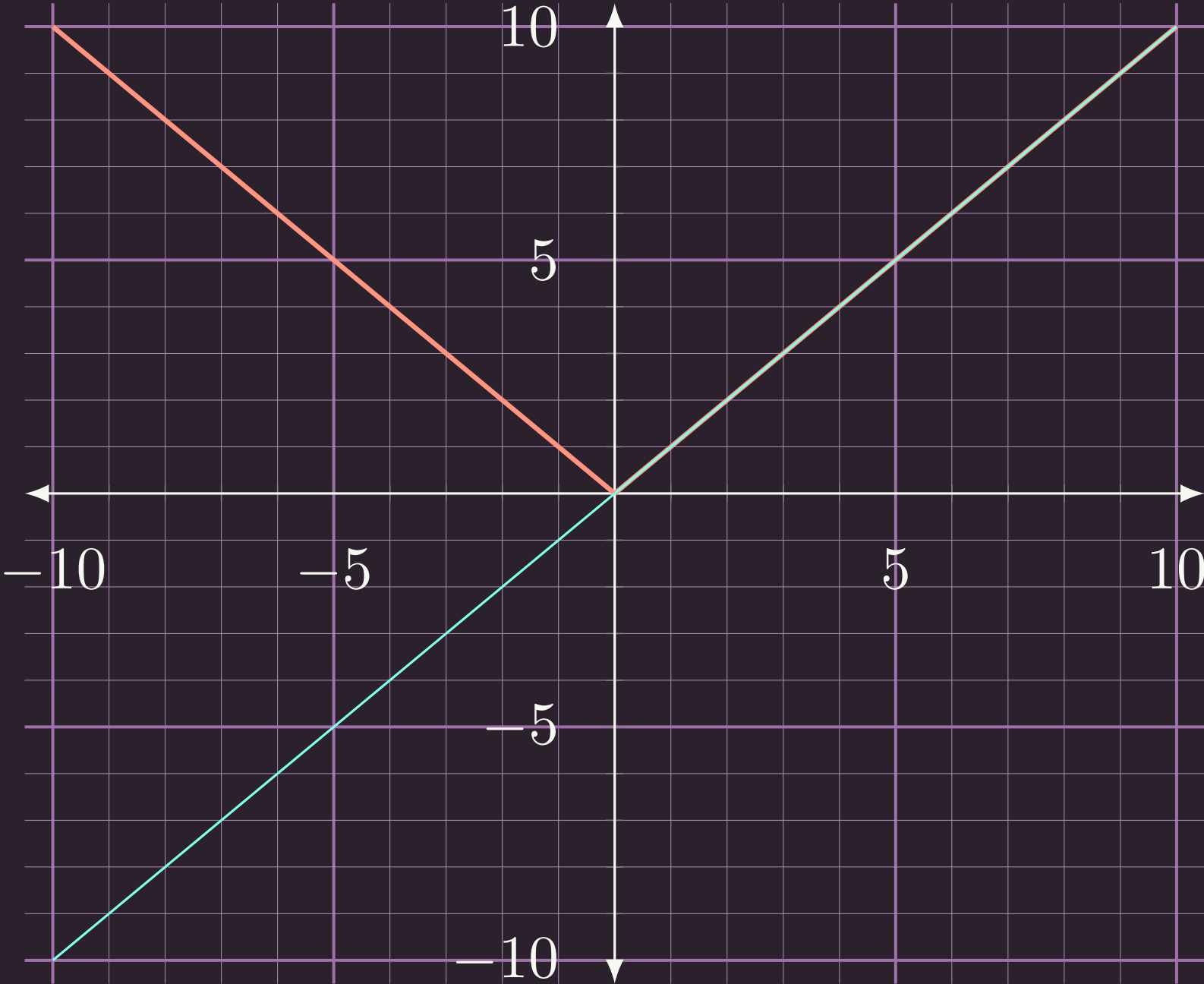
$$f(x) = \begin{cases} x, & [0, 2) \\ \frac{1}{2}x, & (2, 6] \\ \frac{3}{5}x, & (6, 9] \\ -x, & (9, 15] \end{cases}$$

Example:

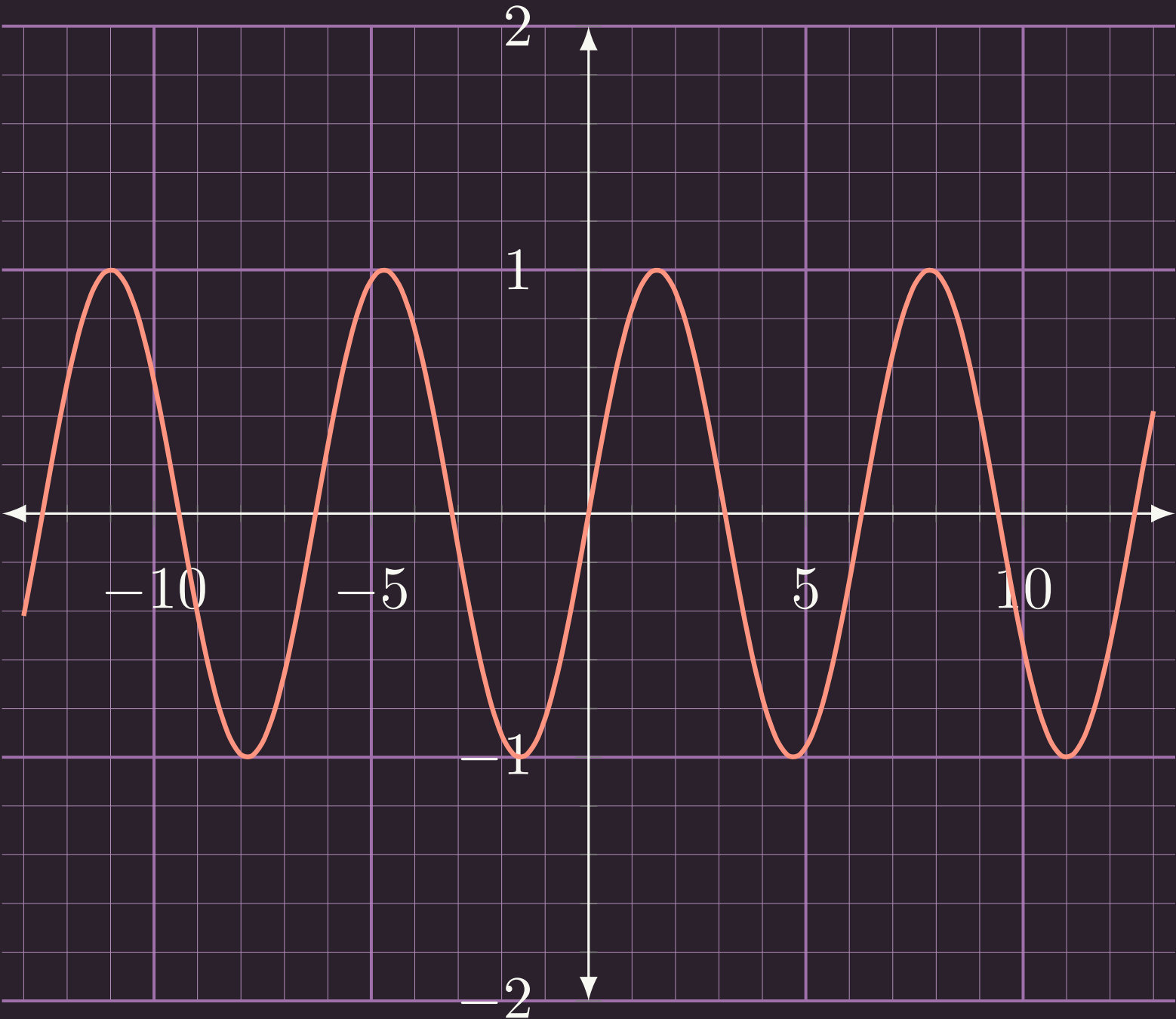


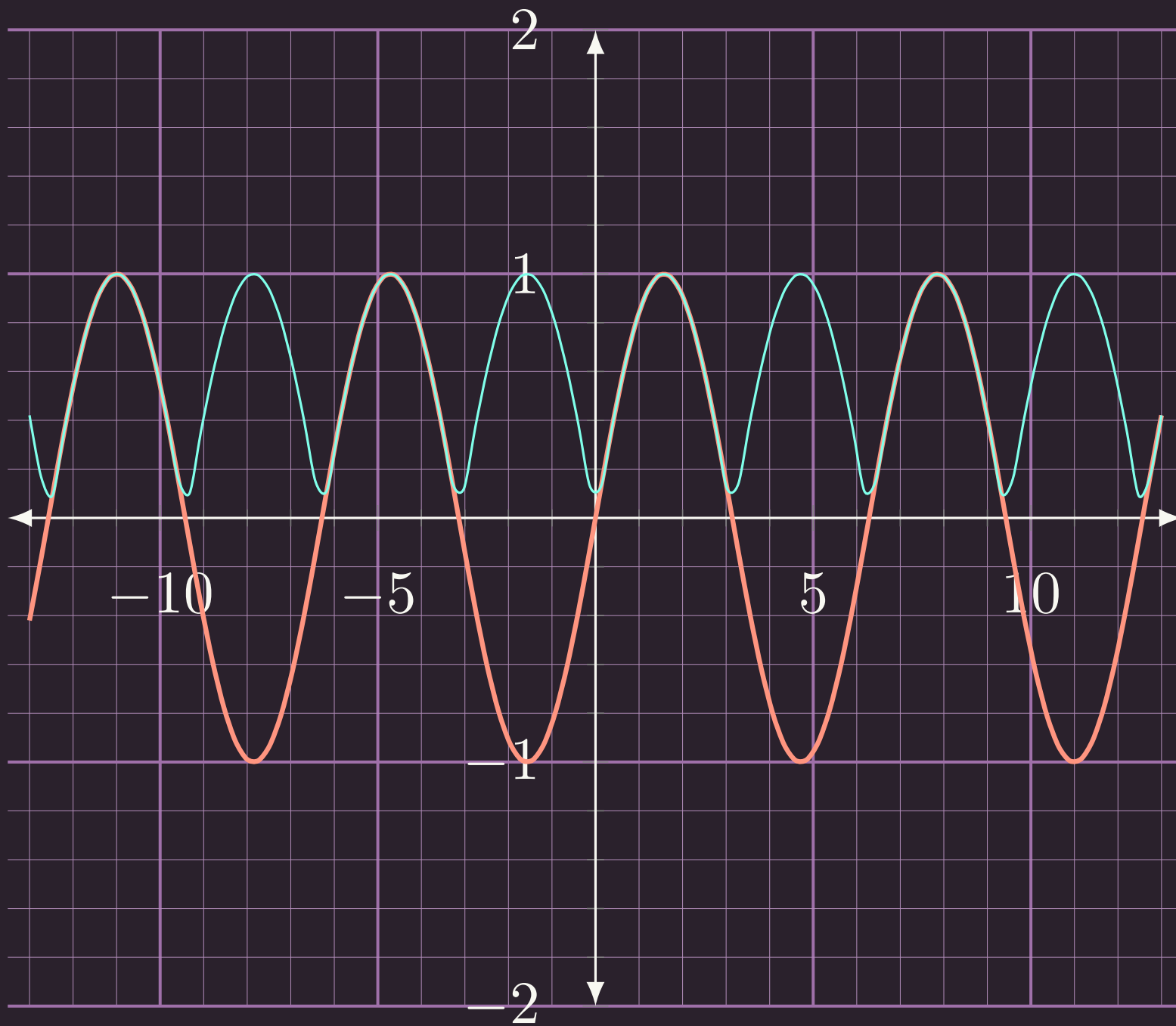
Absolute Value

Example:



Example:





Even and Odd

Definition:

A function $f(x)$ is called:

Even: If $\forall x \in D$ we have $f(-x) = f(x)$

Odd: If $\forall x \in D$ we have $f(-x) = -f(x)$

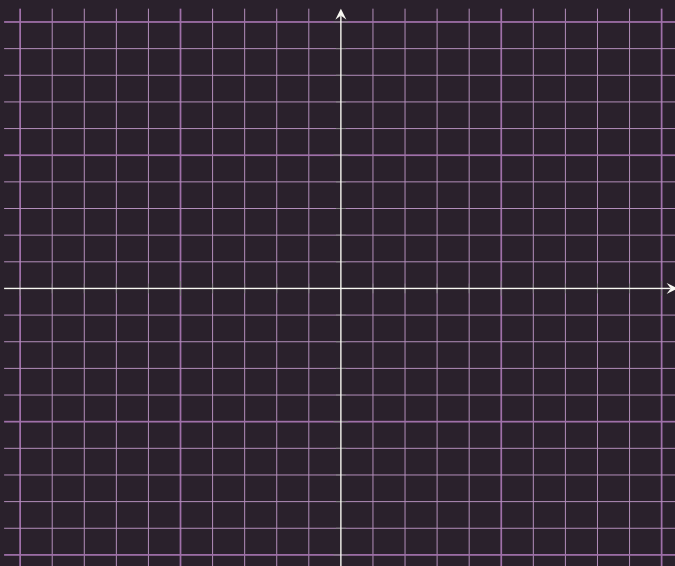
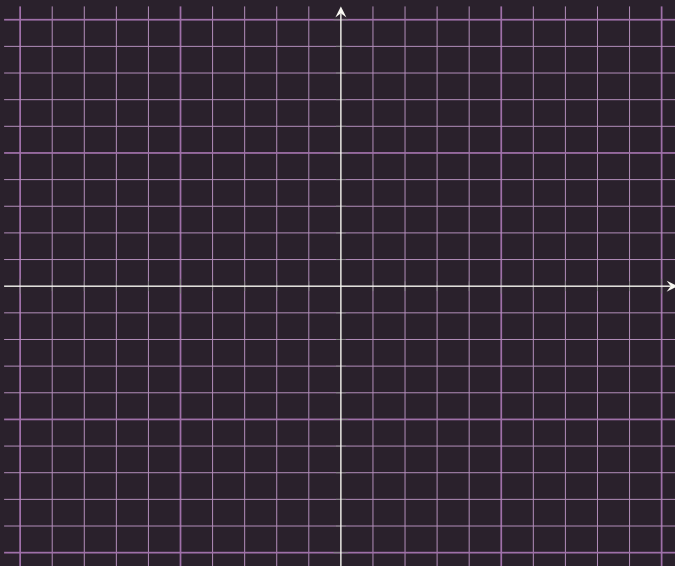
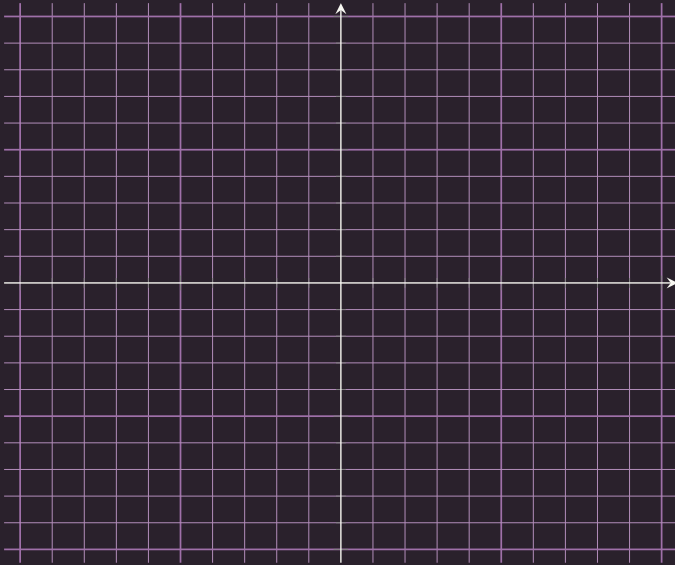
Neither:

Symmetries:

Even:

Odd:

Neither:



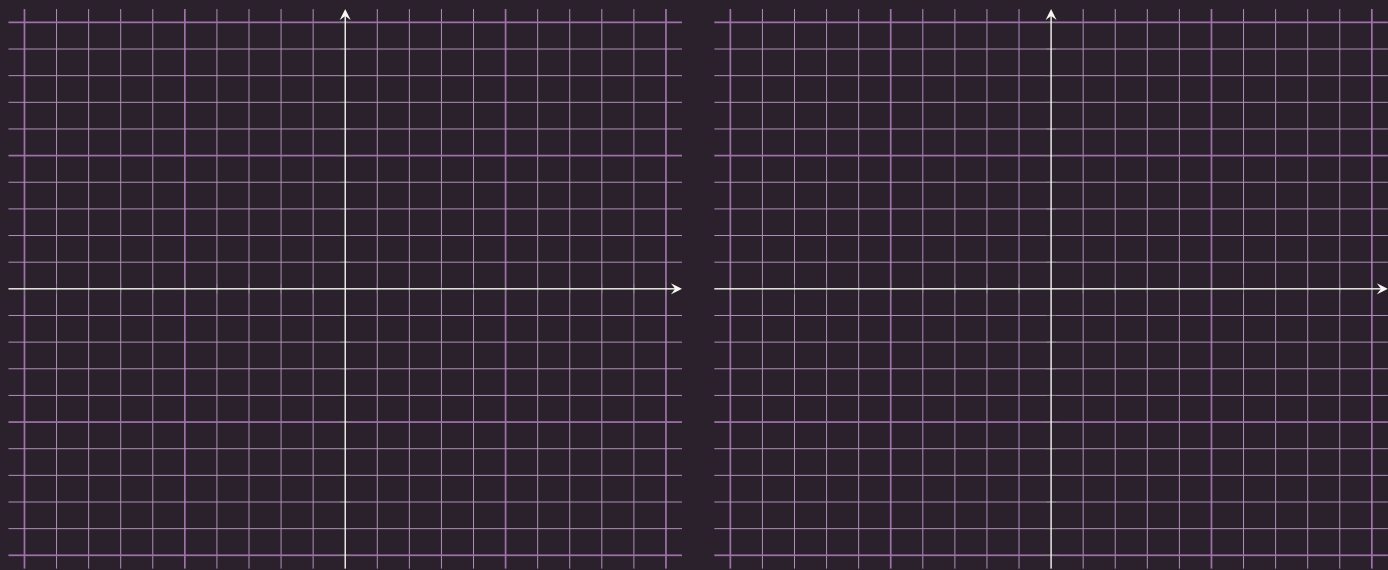
Increasing Decreasing

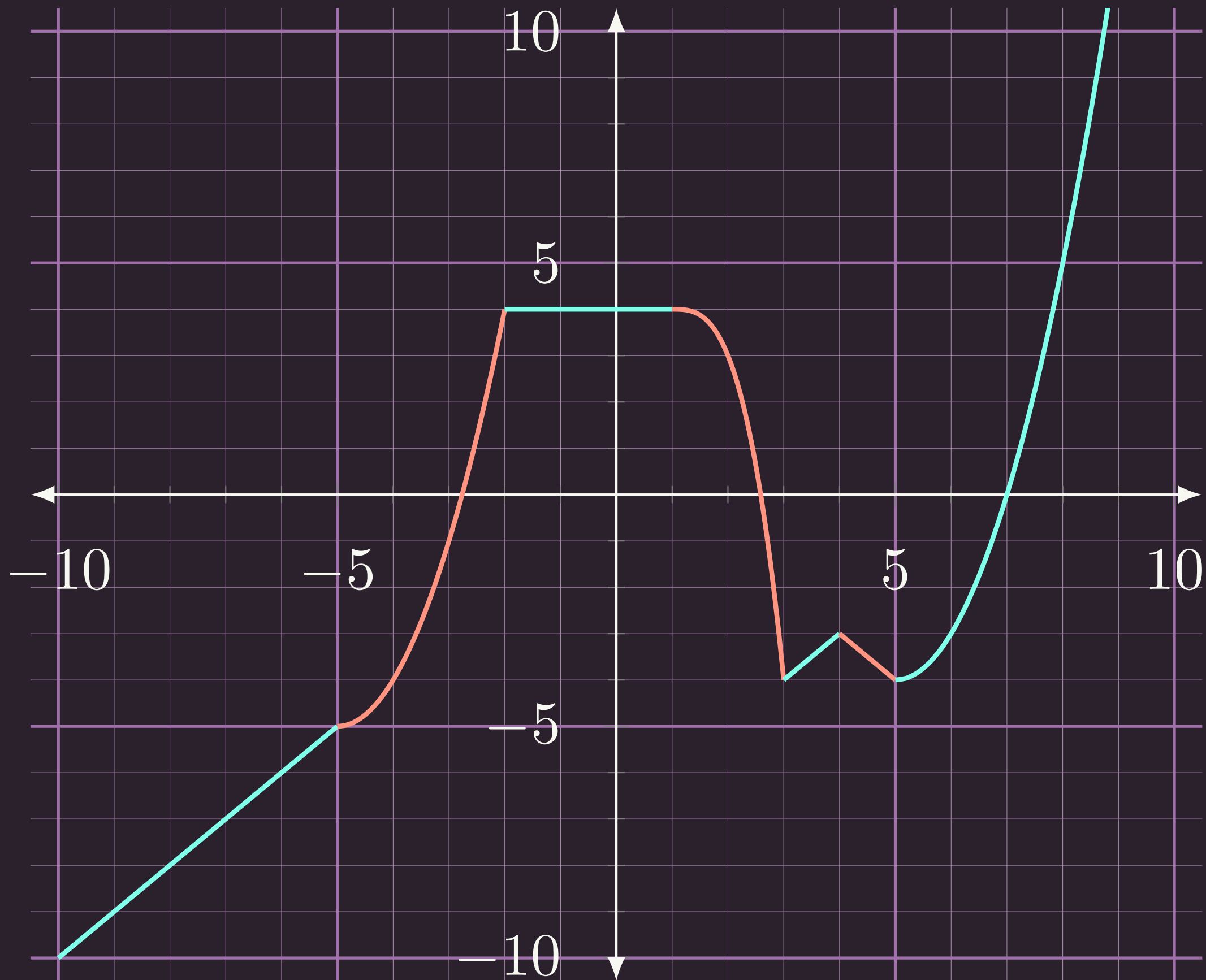
Definition:

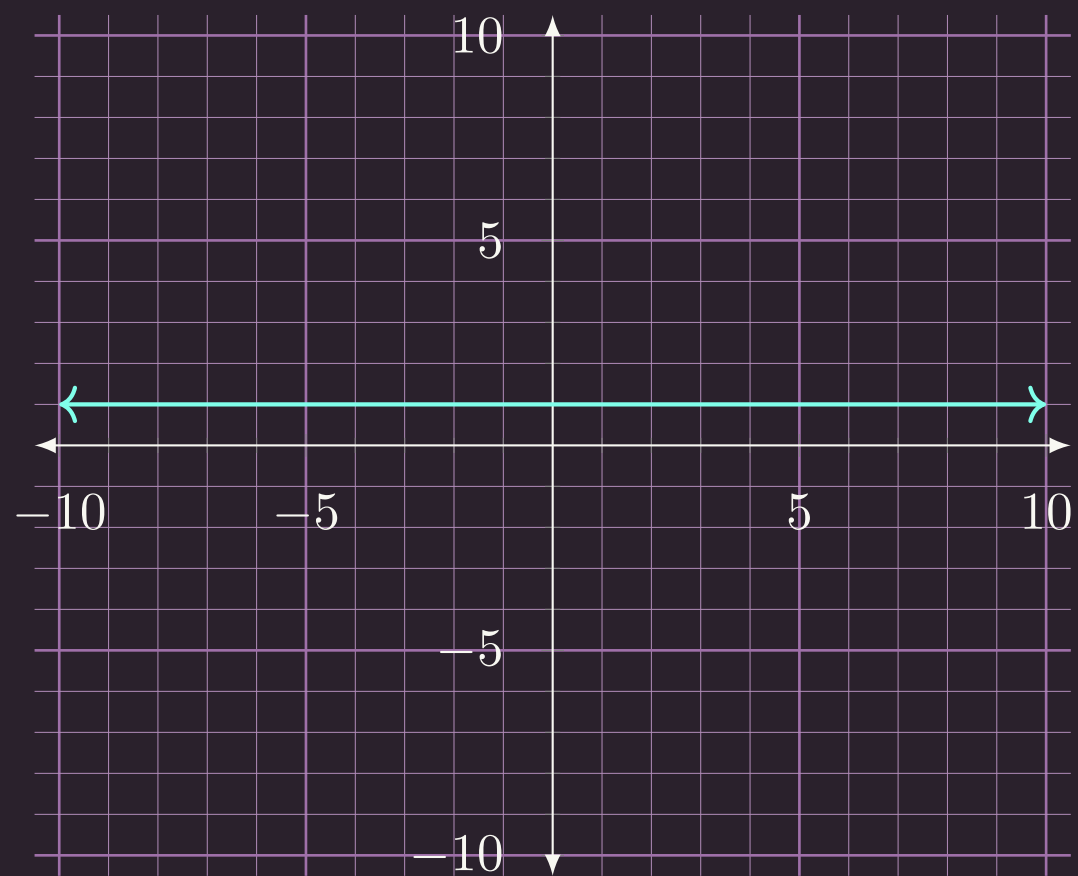
A function $f(x)$ on an interval I is called:

Increasing: $\forall a, b \in I$ if $a < b$ then $f(a) < f(b)$

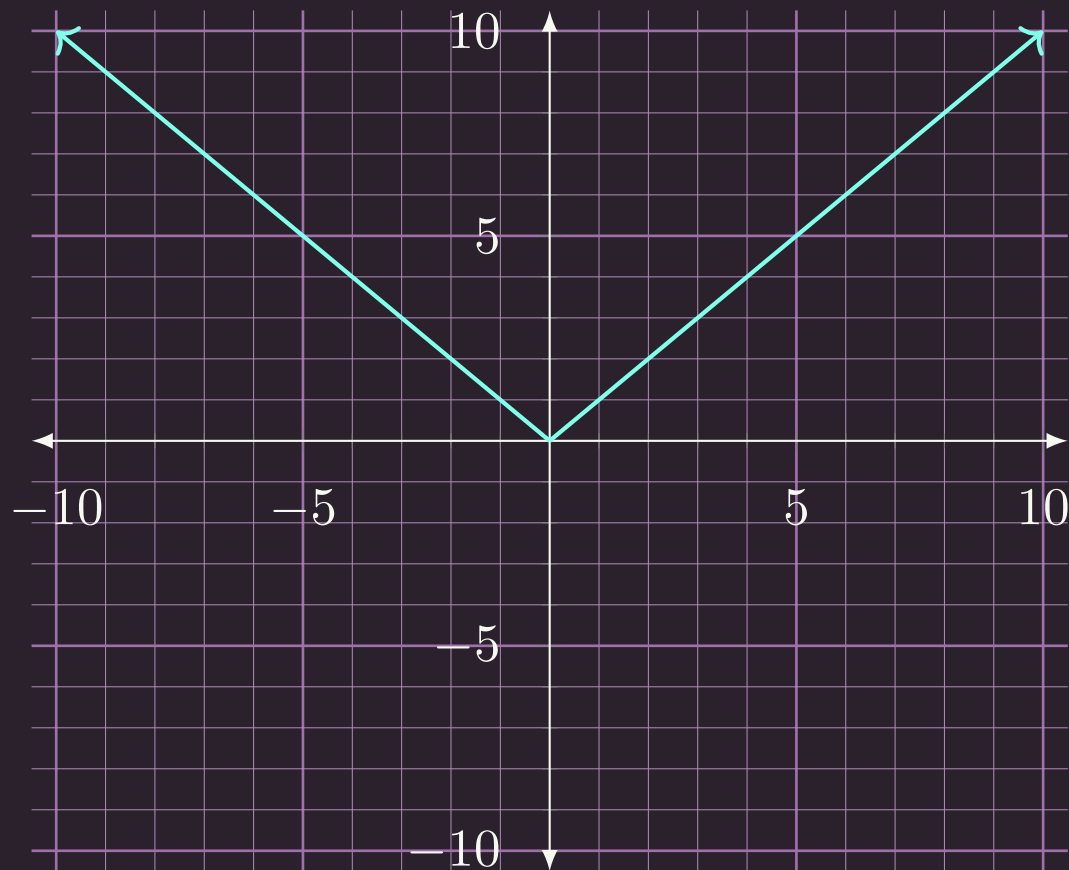
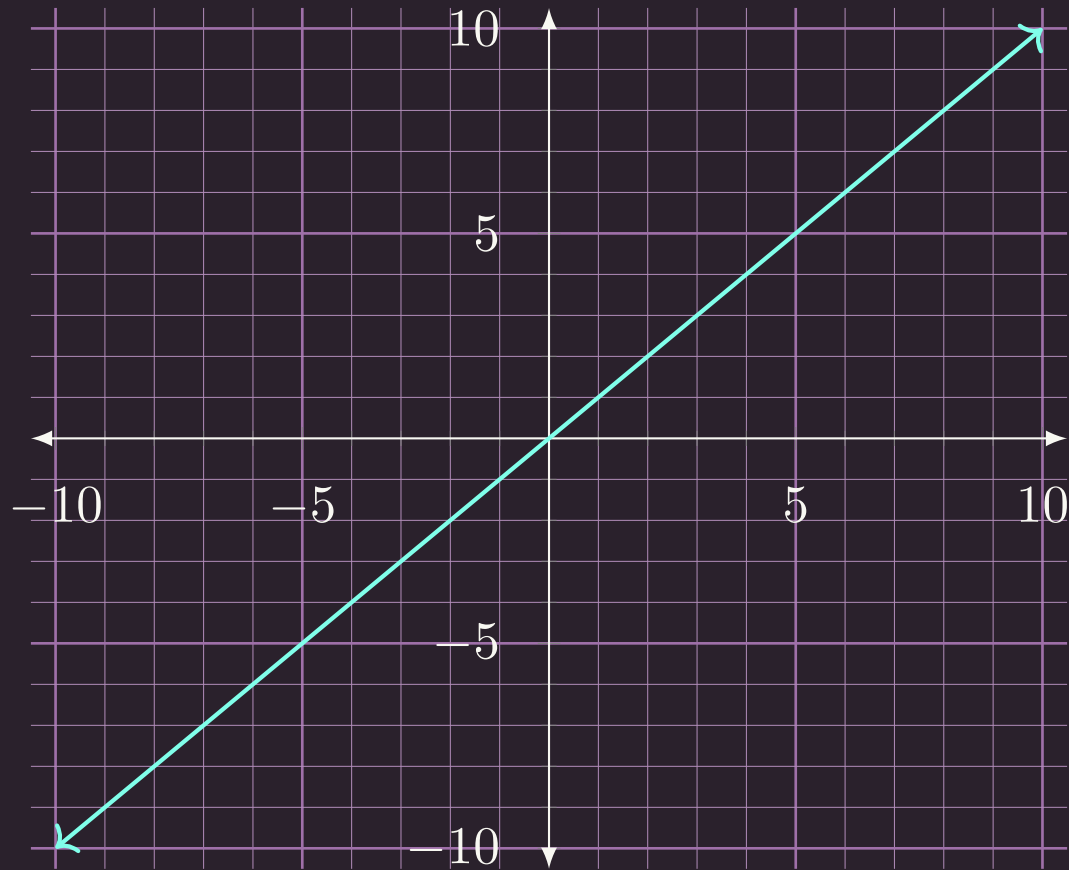
Decreasing: $\forall a, b \in I$ if $a < b$ then $f(a) > f(b)$

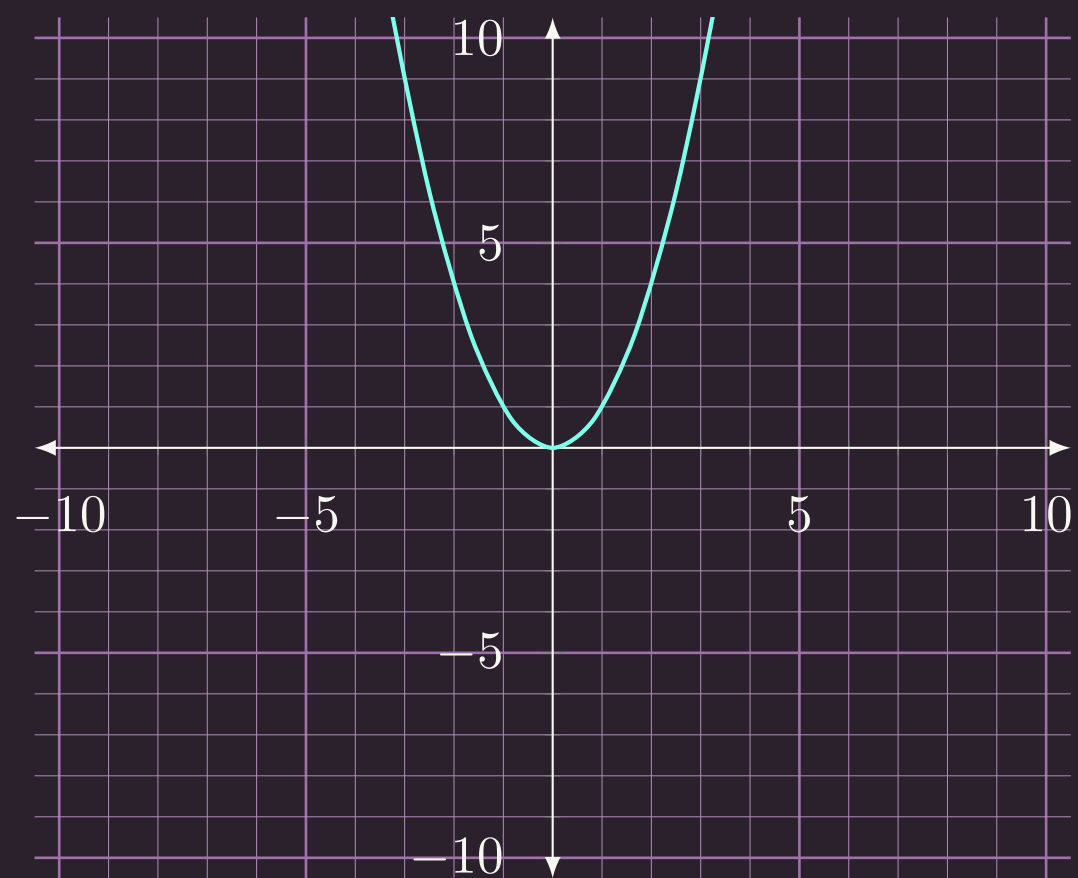
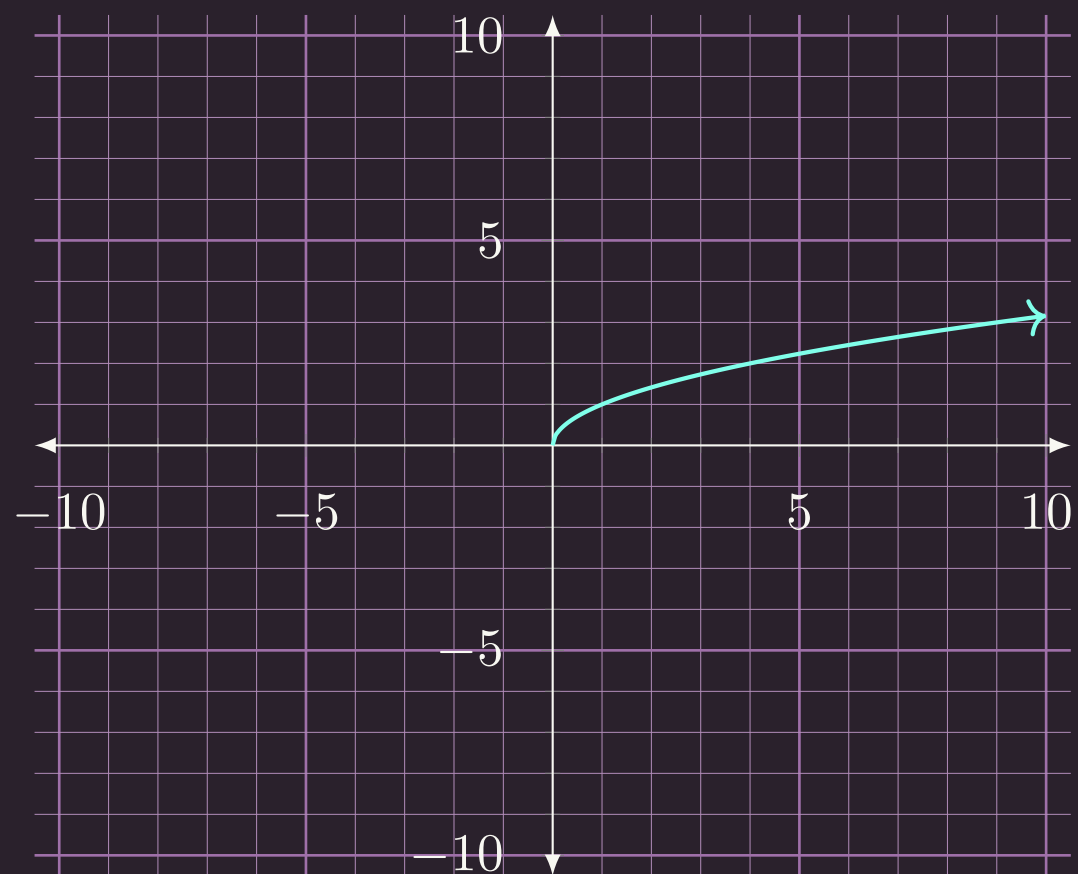


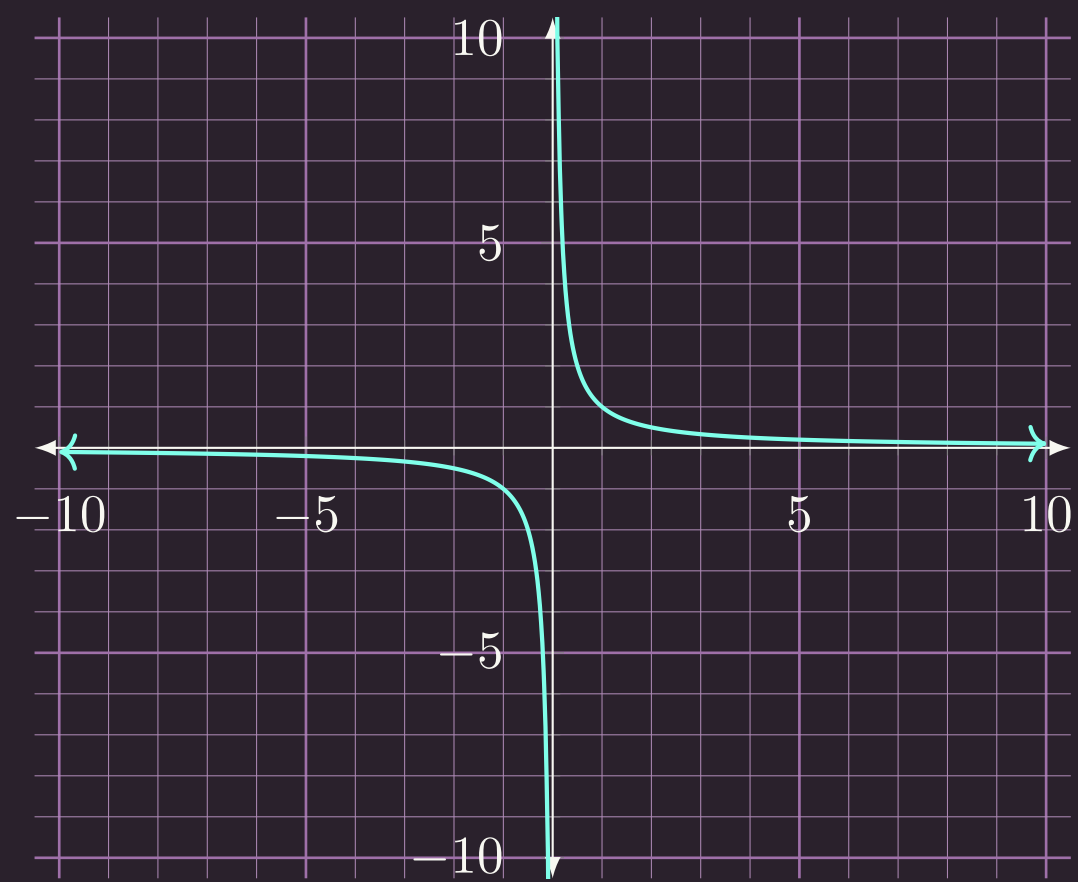
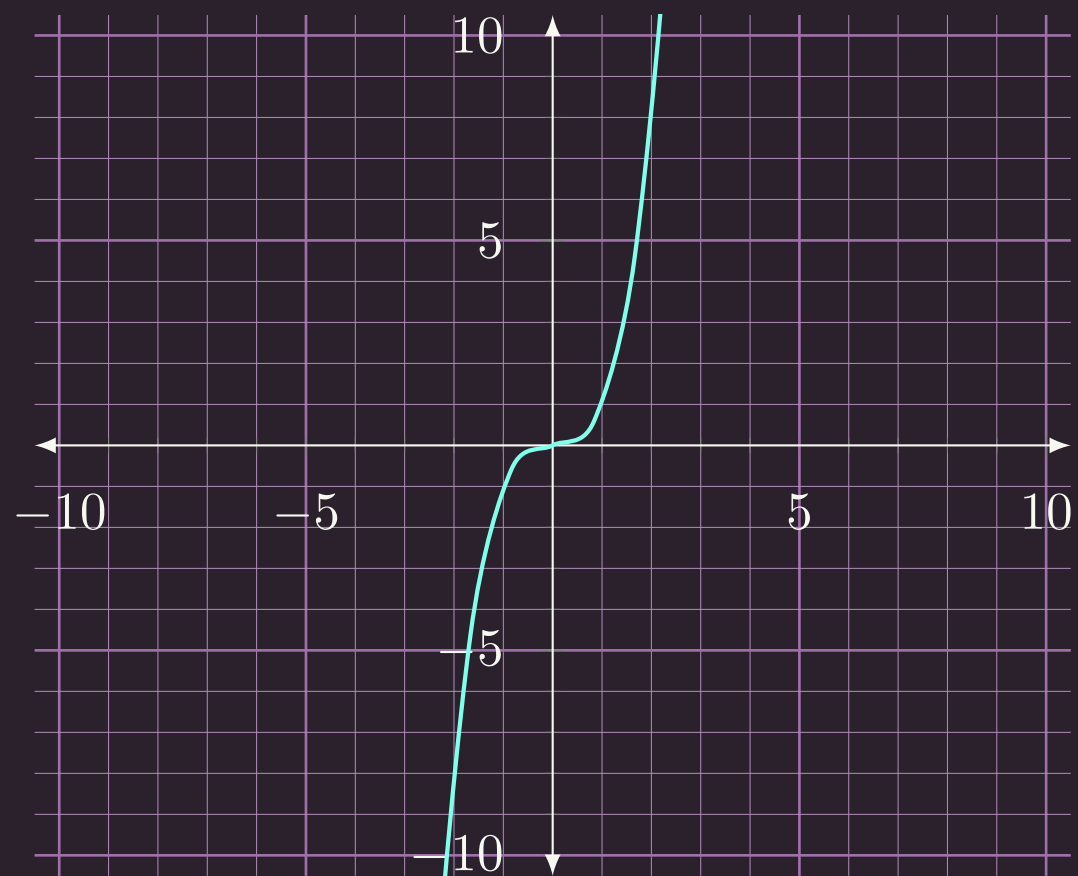


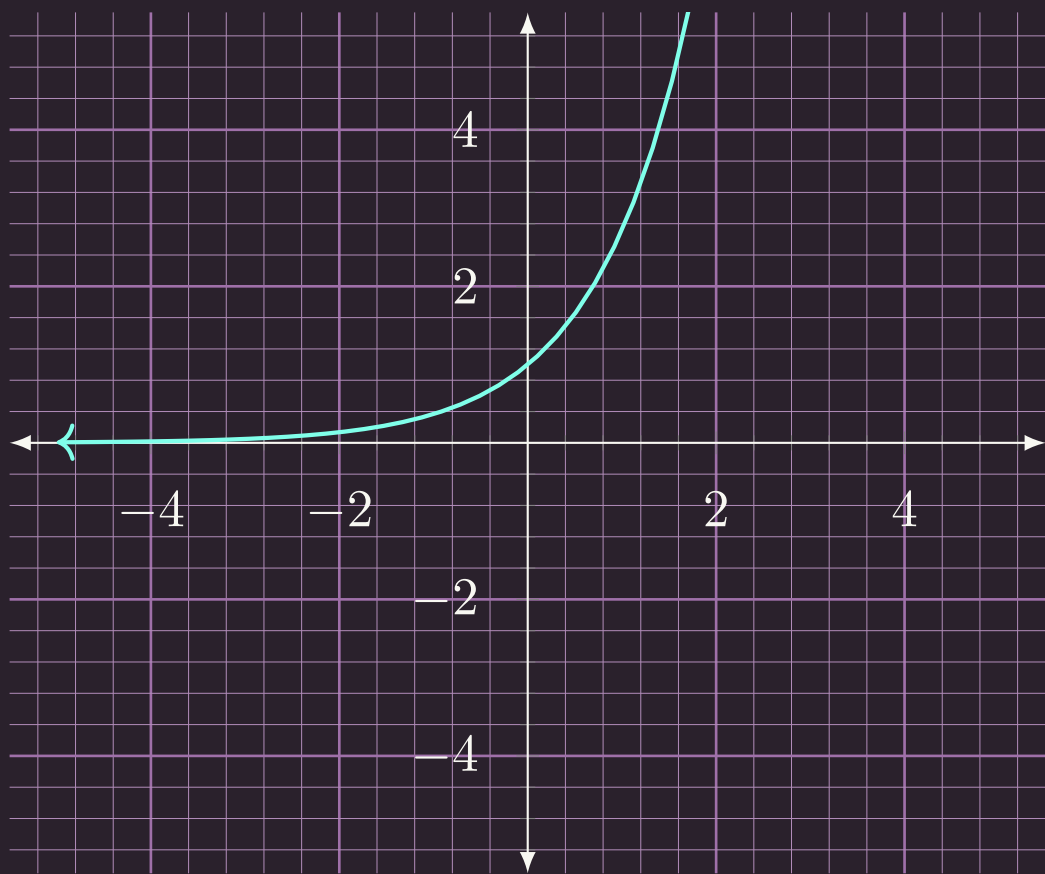
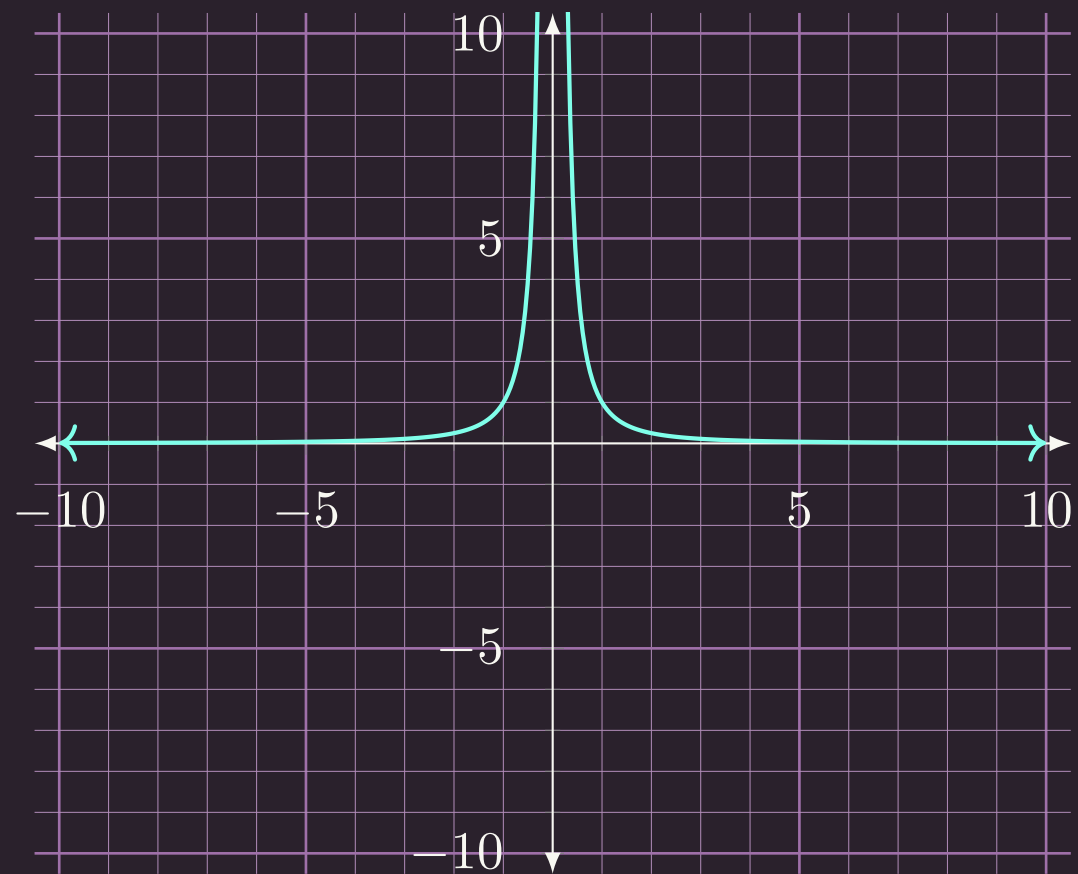


”Parent” Fucntions





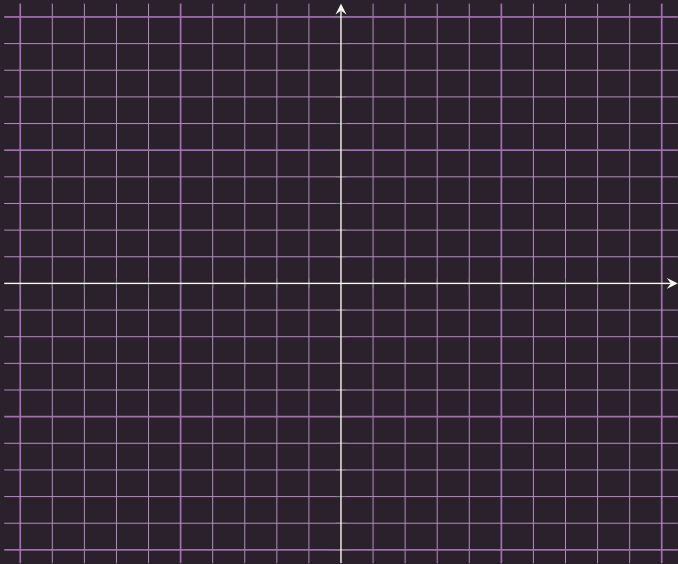




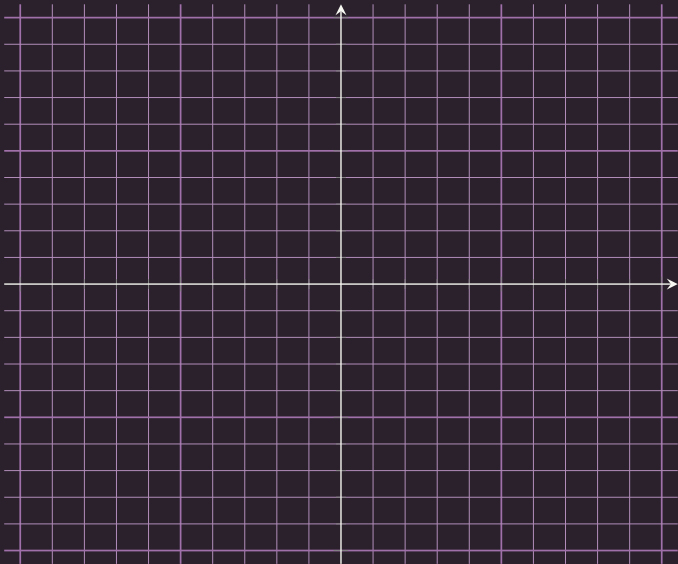
Translation of functions

Shifts:

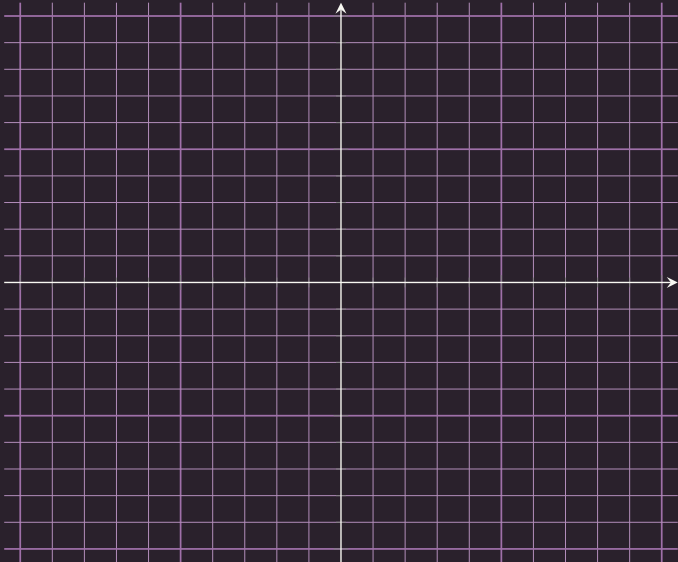
_____ : $f(x) \rightarrow f(x - c)$



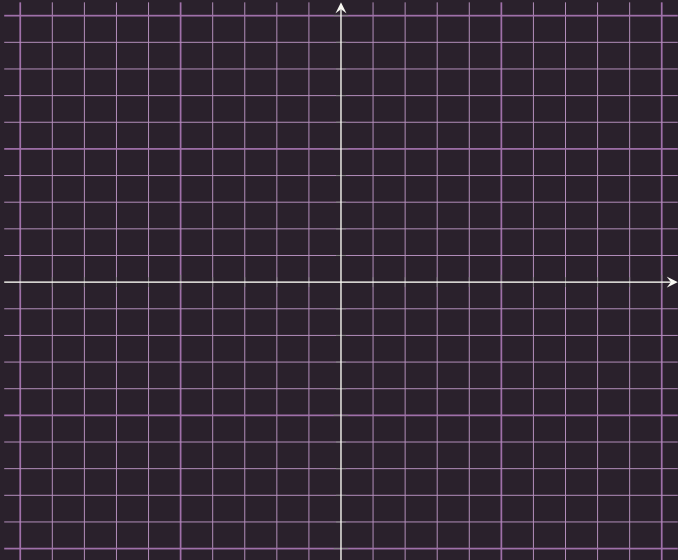
_____ : $f(x) \rightarrow f(x + c)$



_____ : $f(x) \rightarrow f(x) - c$



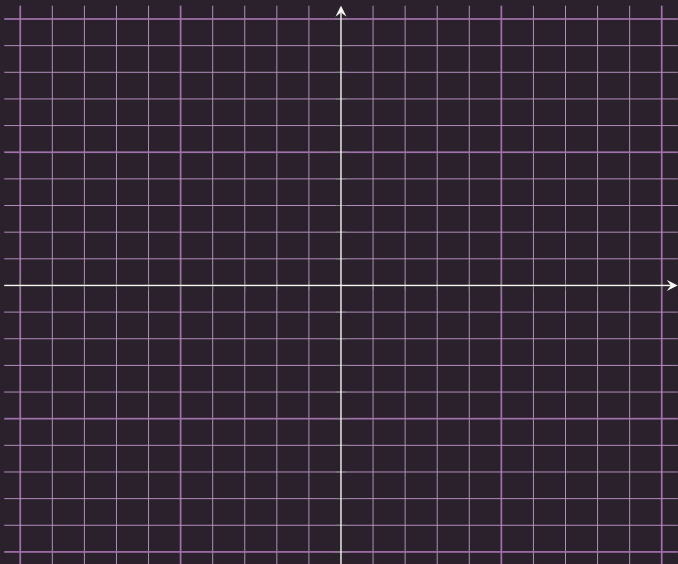
_____ : $f(x) \rightarrow f(x) + c$



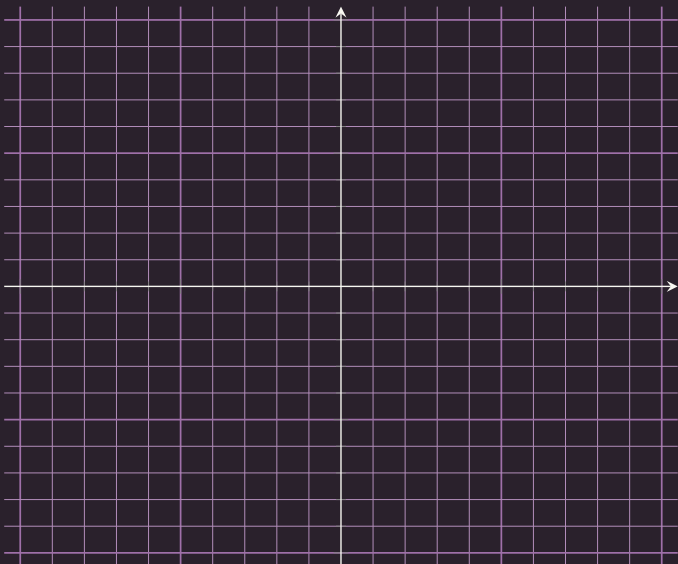
Stretching and reflection:

For $1 < c$

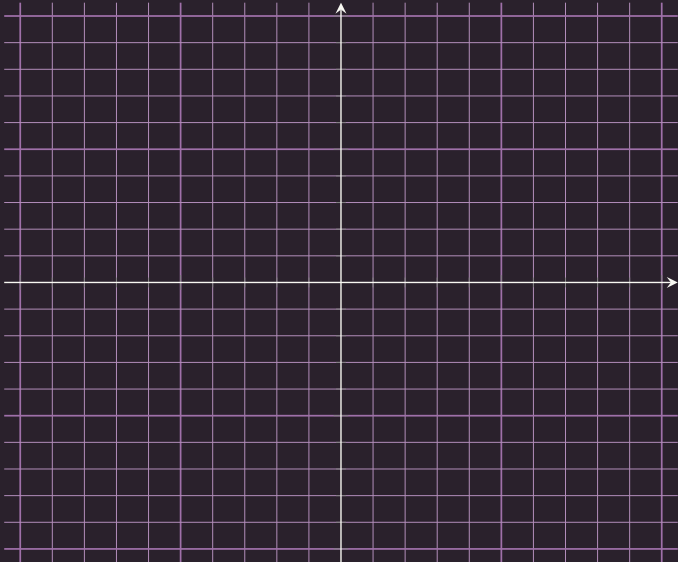
_____ : $f(x) \rightarrow f(cx)$



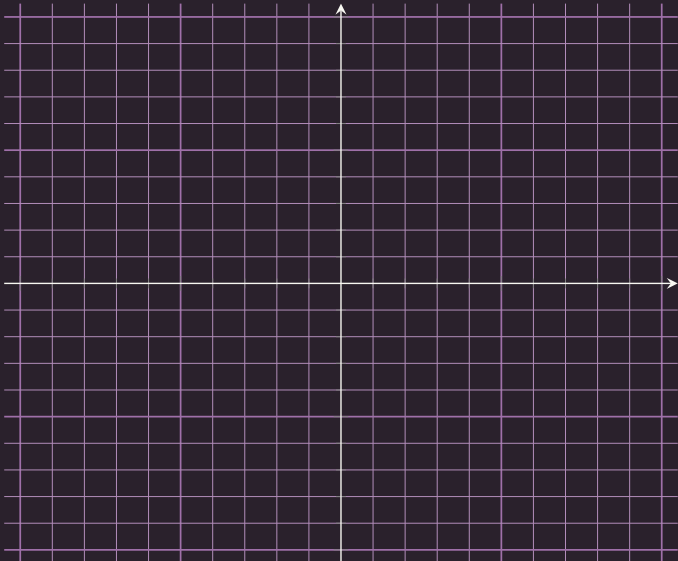
_____ : $f(x) \rightarrow f(\frac{1}{c}x)$



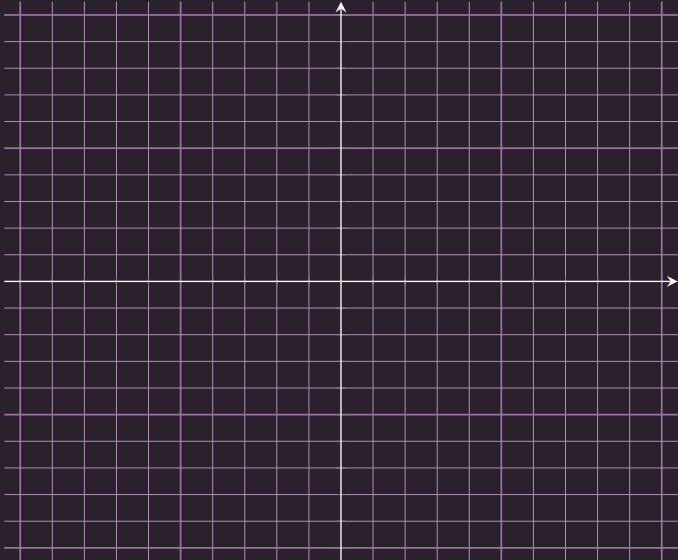
_____ : $f(x) \rightarrow cf(x)$



_____ : $f(x) \rightarrow \frac{1}{c}f(x)$



_____ : $f(x) \rightarrow -f(x)$



_____ : $f(x) \rightarrow f(-x)$

