

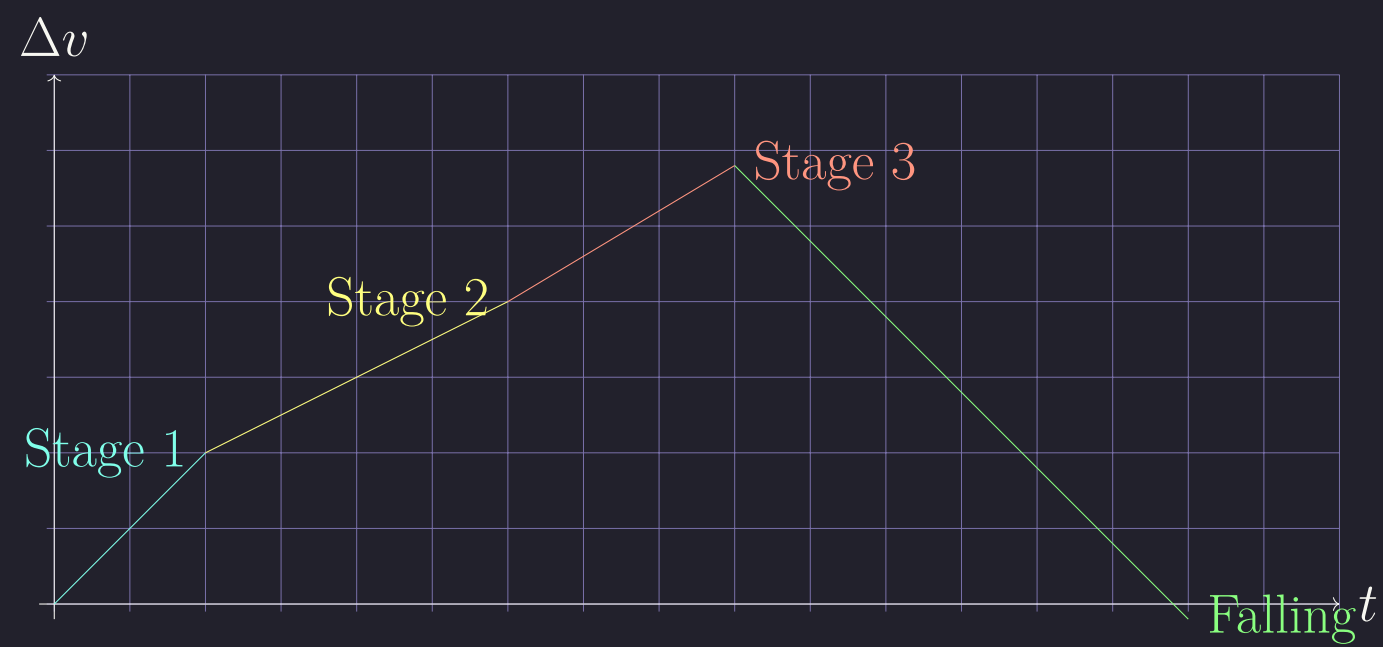
Types of Functions

Piecewise Functions

Notation

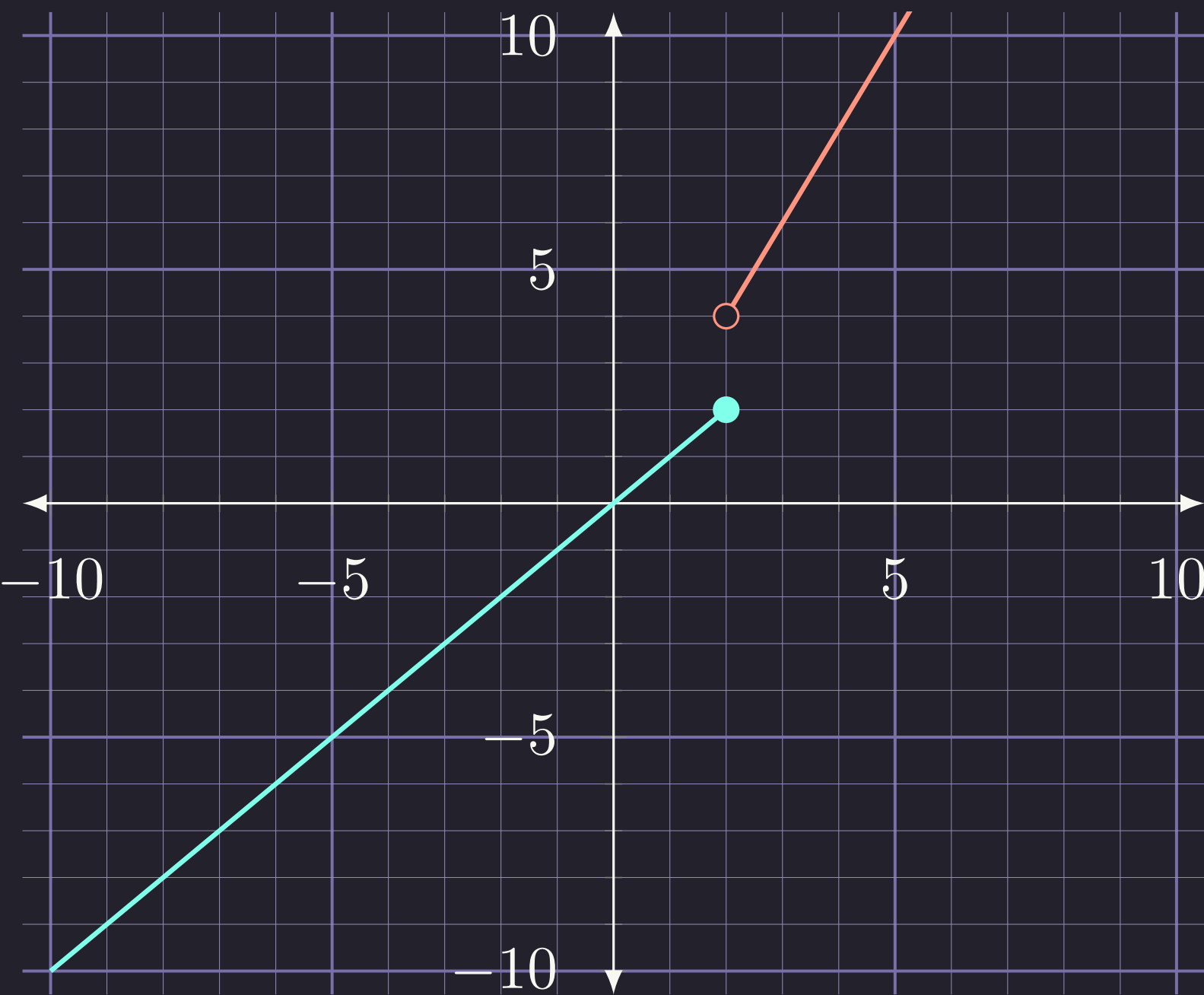
$$f(x) = \begin{cases} \text{function,} & \text{condition} \\ \vdots & \vdots \\ \text{function,} & \text{condition} \end{cases}$$

Example:



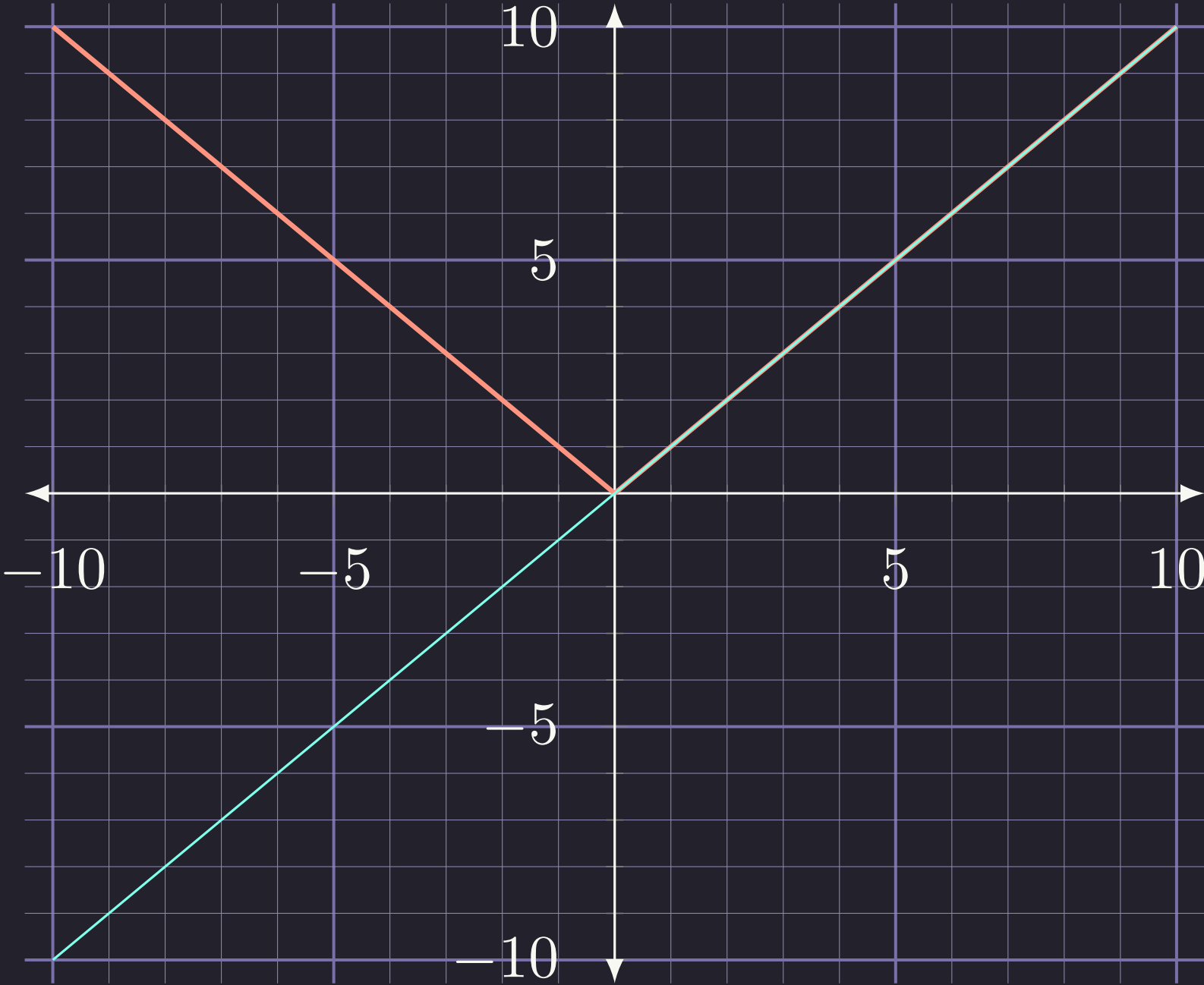
$$f(x) = \begin{cases} x, & [0, 2) \\ \frac{1}{2}x, & (2, 6] \\ \frac{3}{5}x, & (6, 9] \\ -x, & (9, 15] \end{cases}$$

Example:

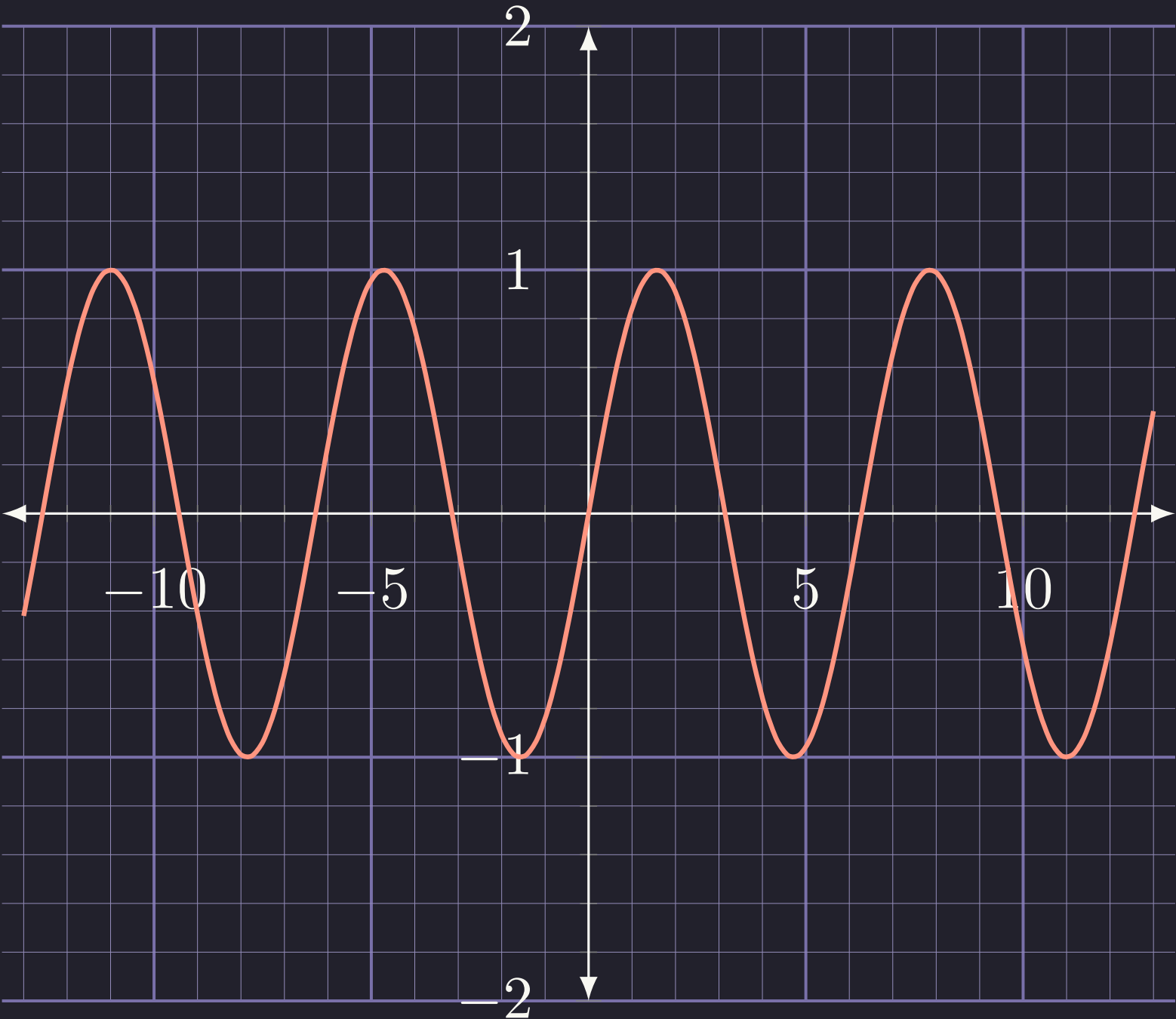


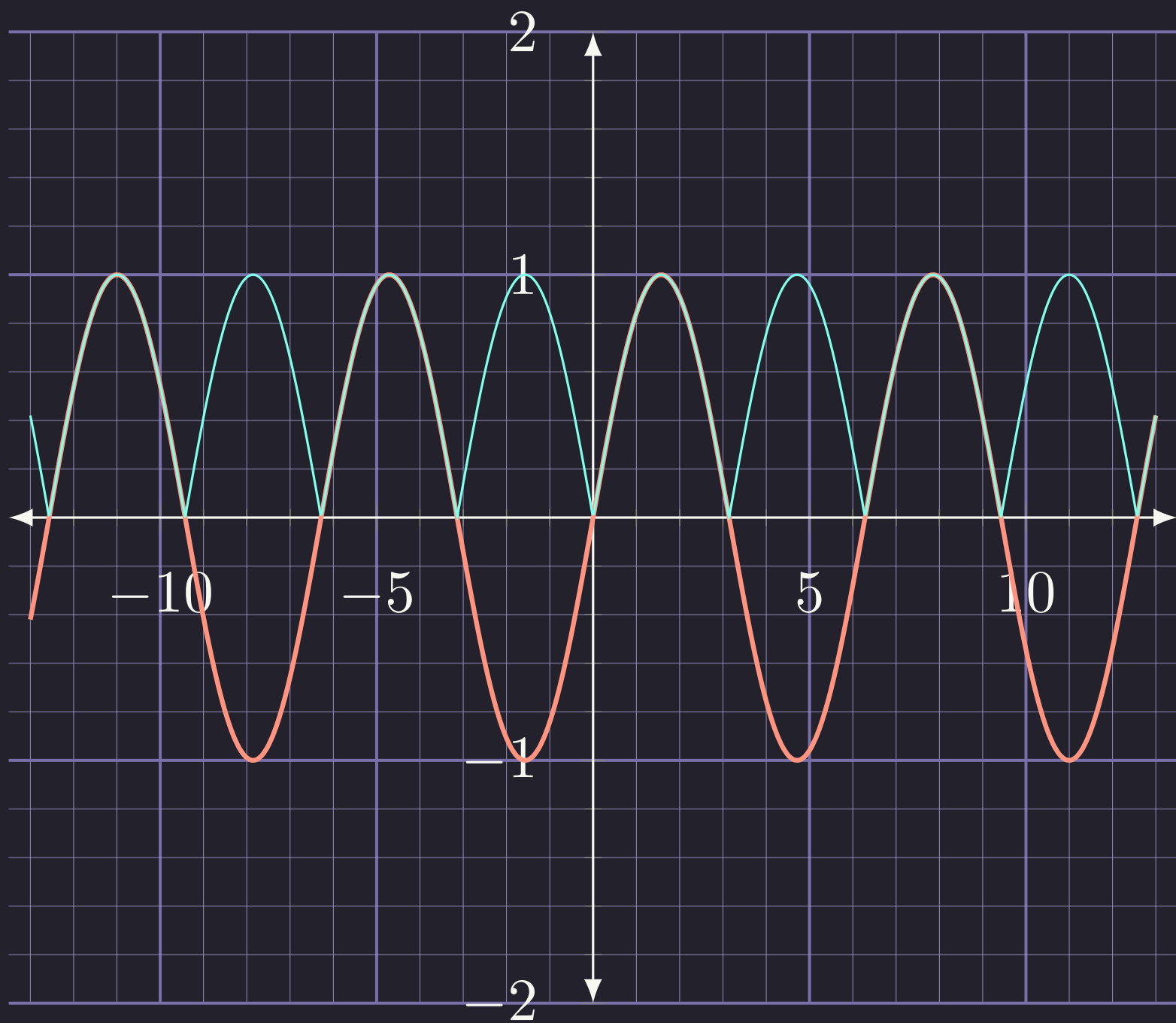
Absolute Value

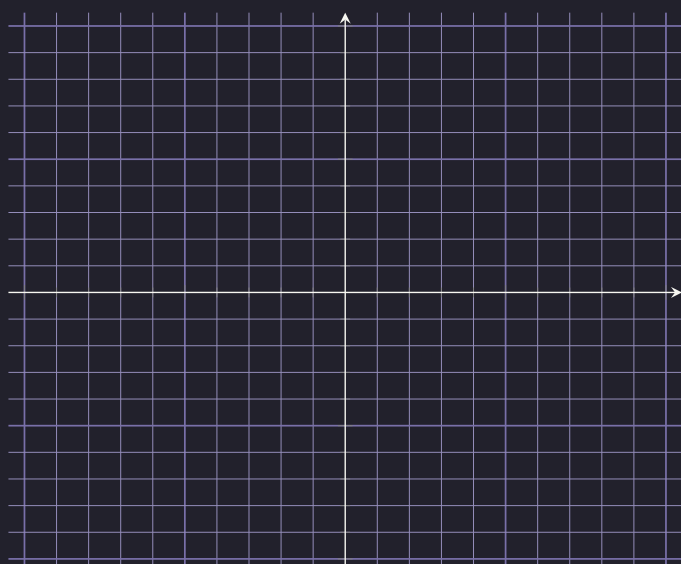
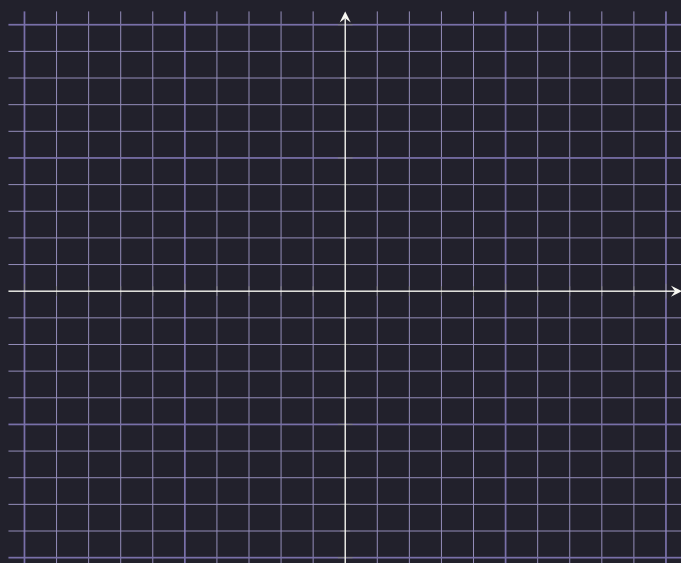
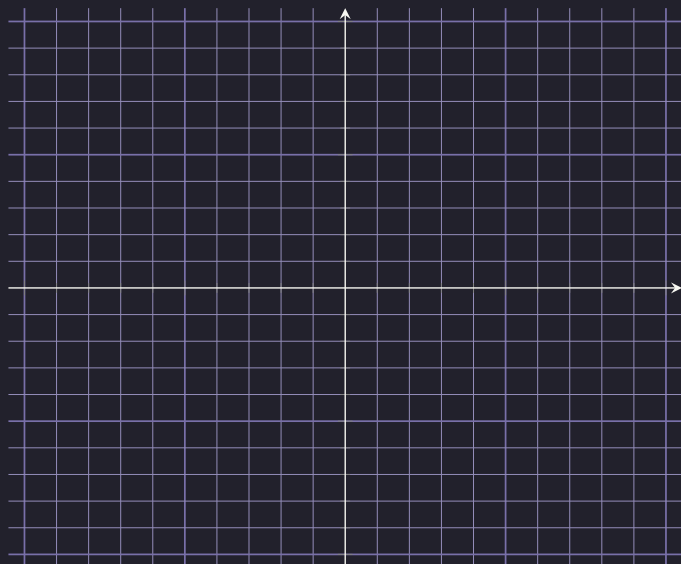
Example:

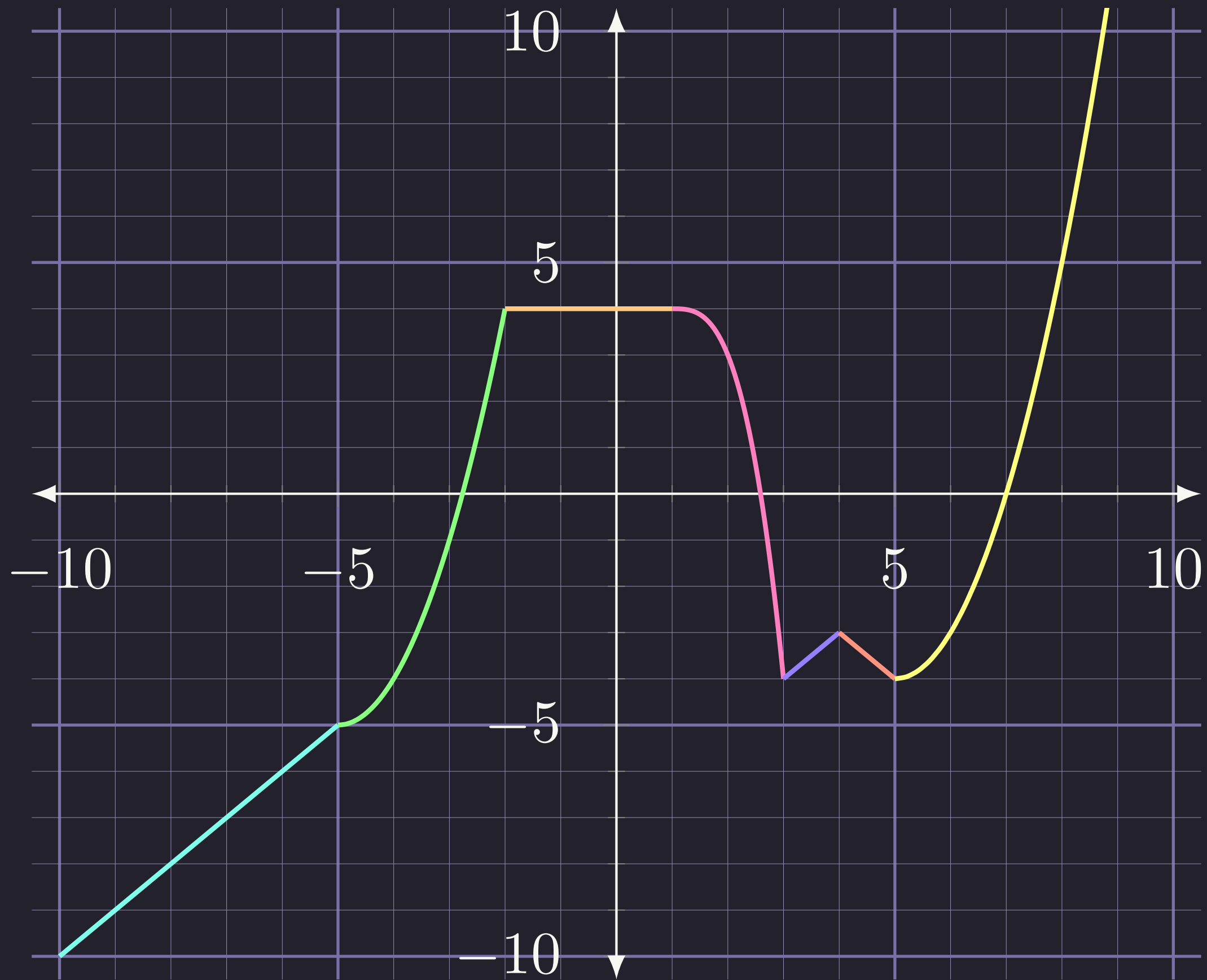


Example:

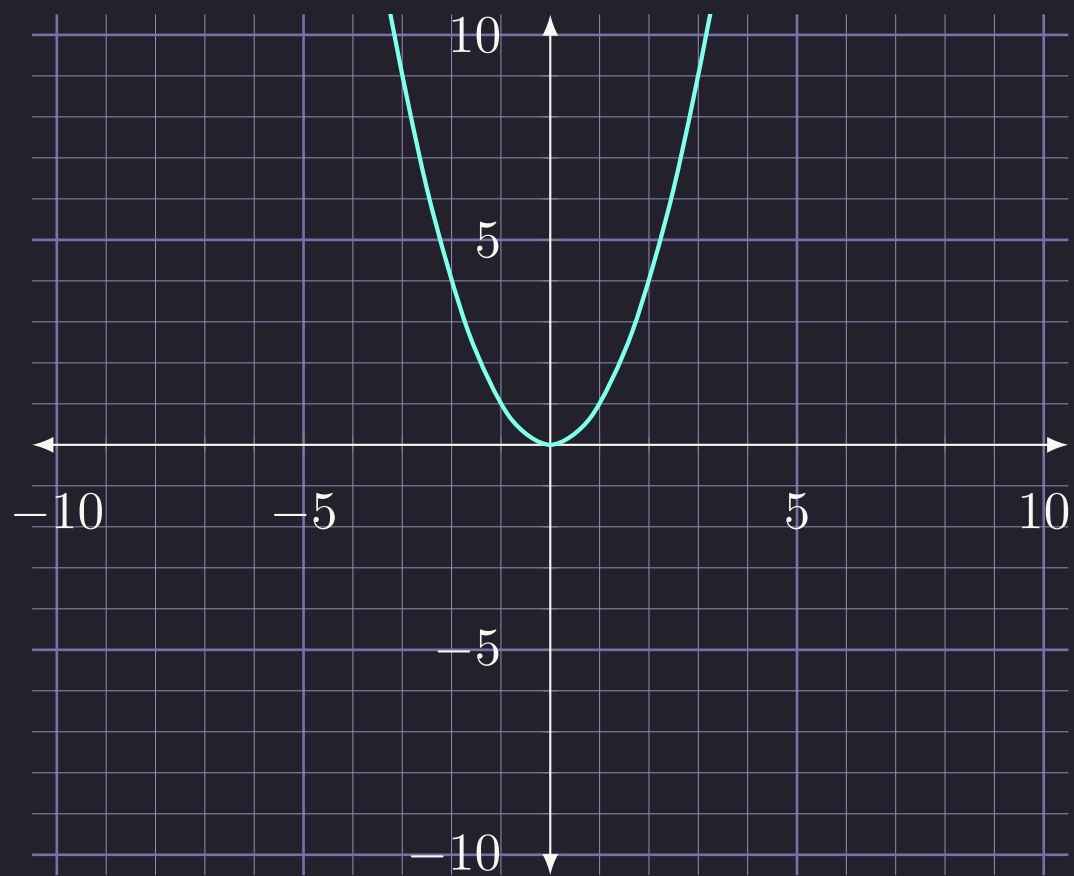
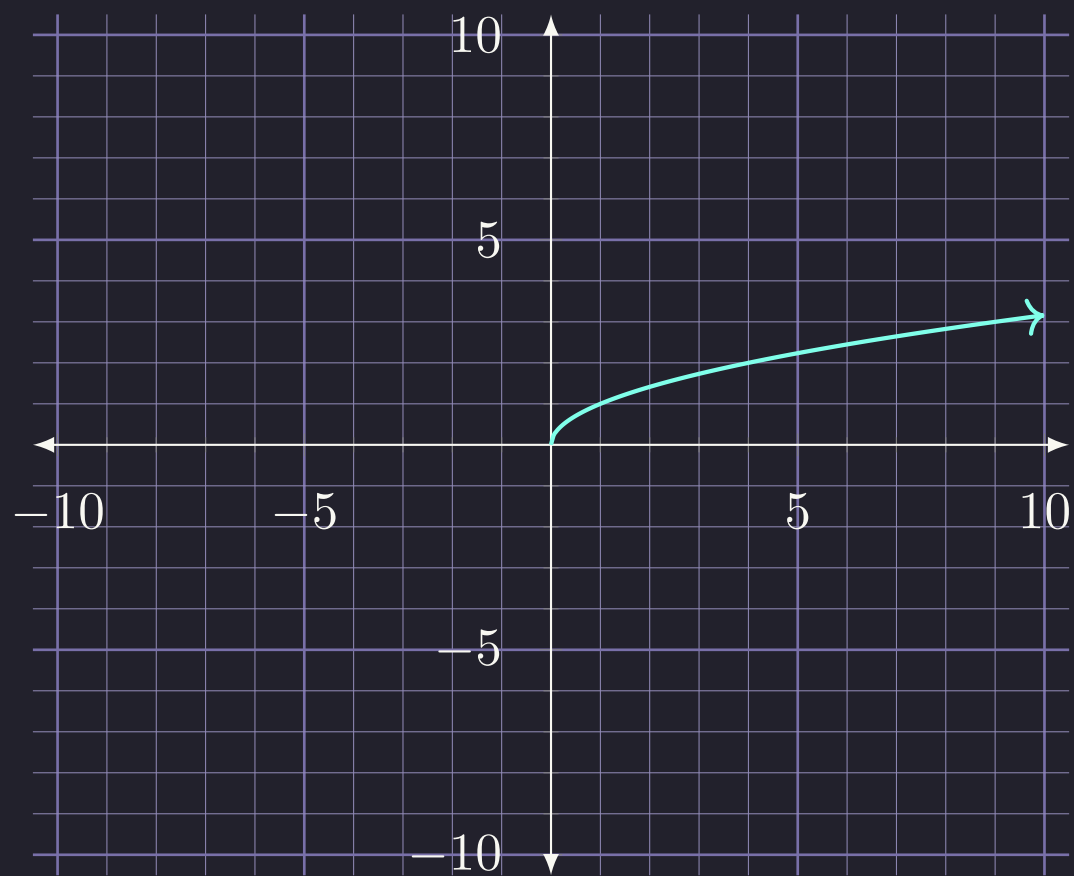
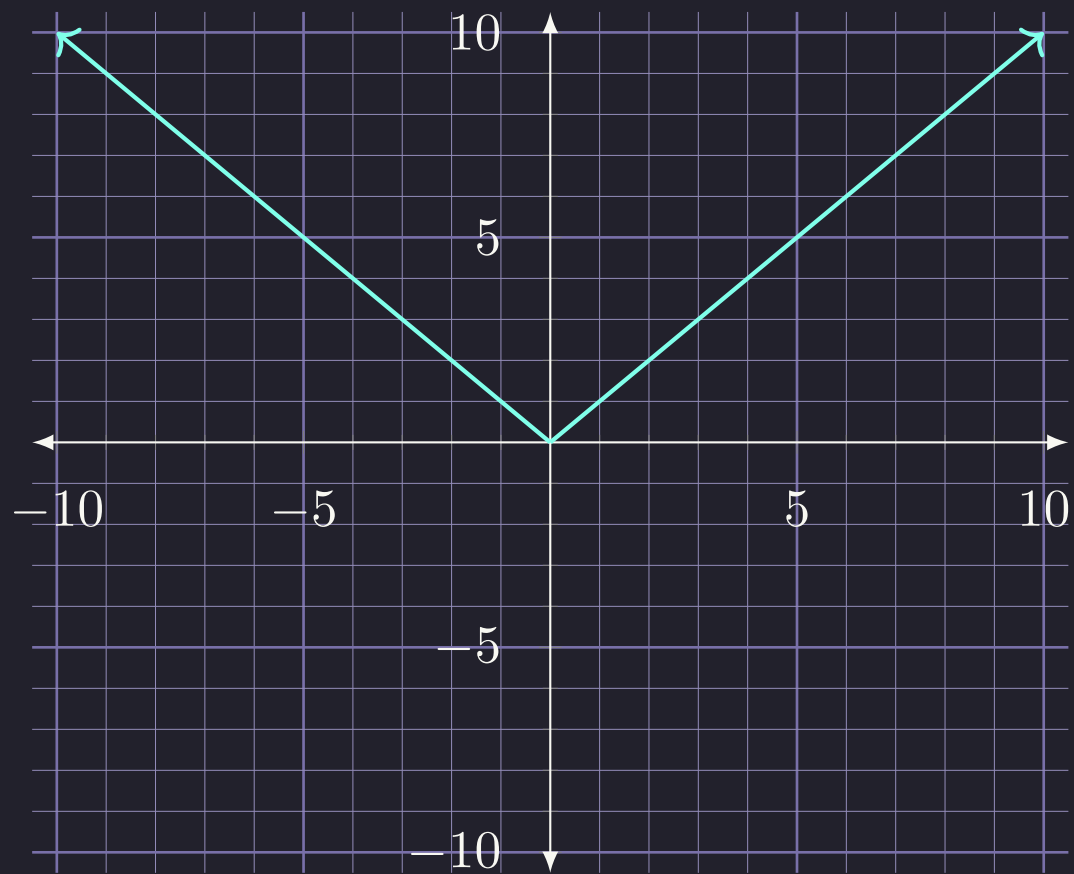
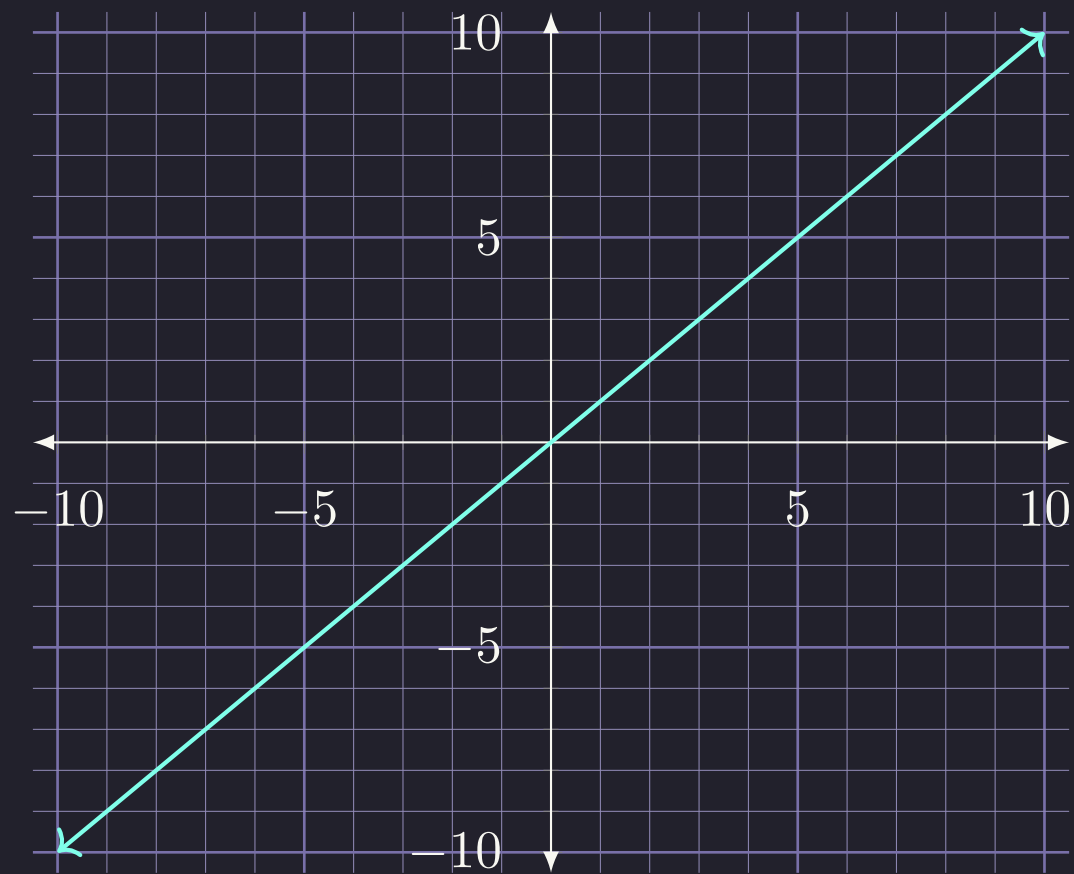


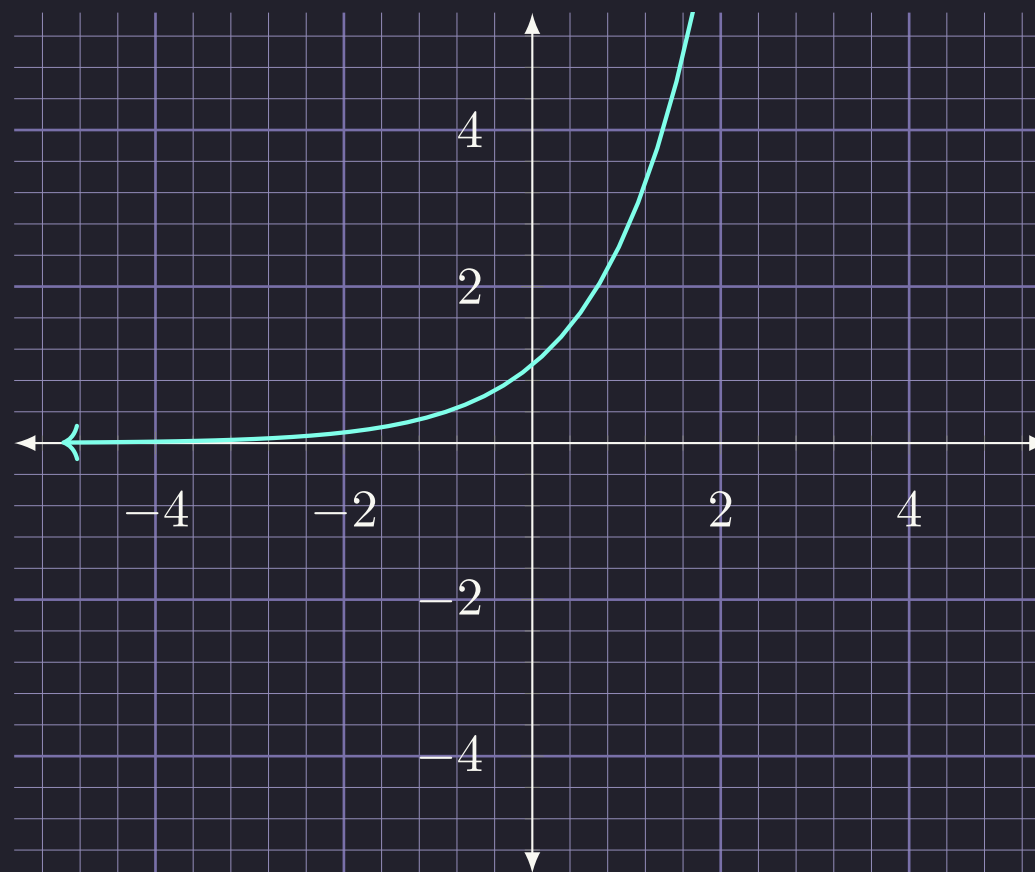
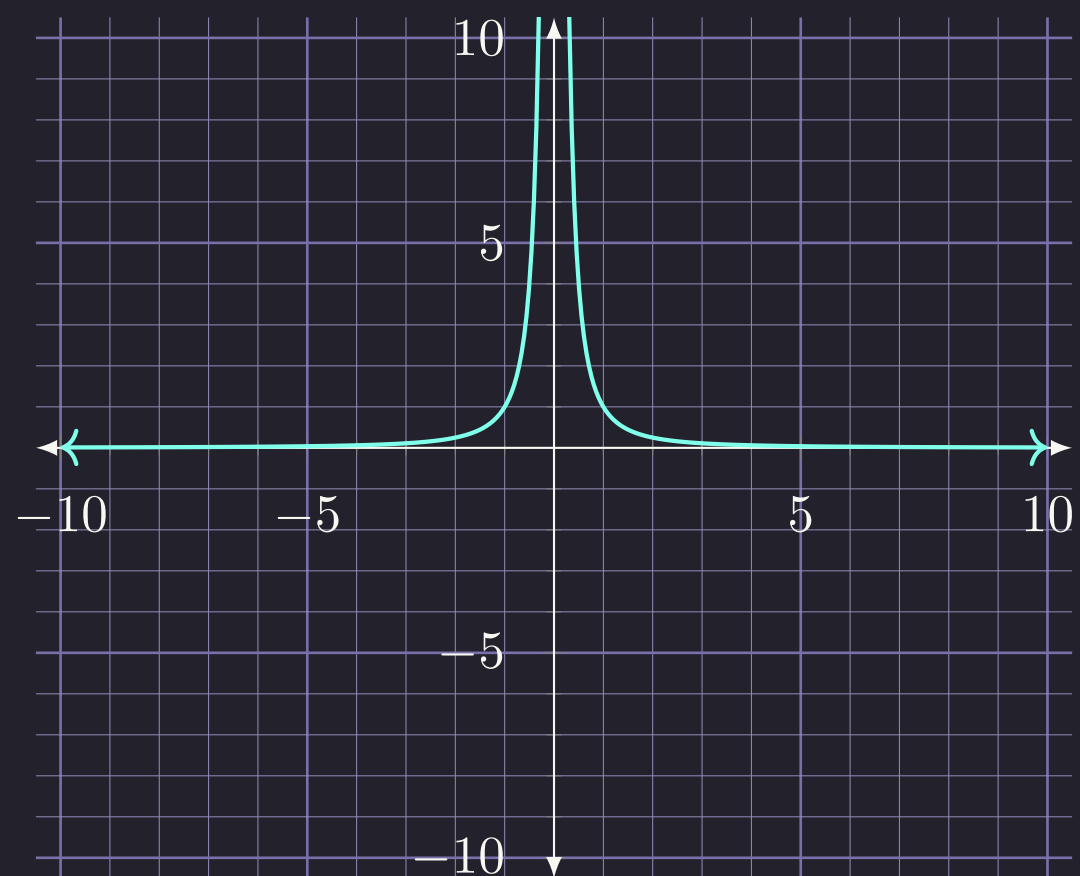
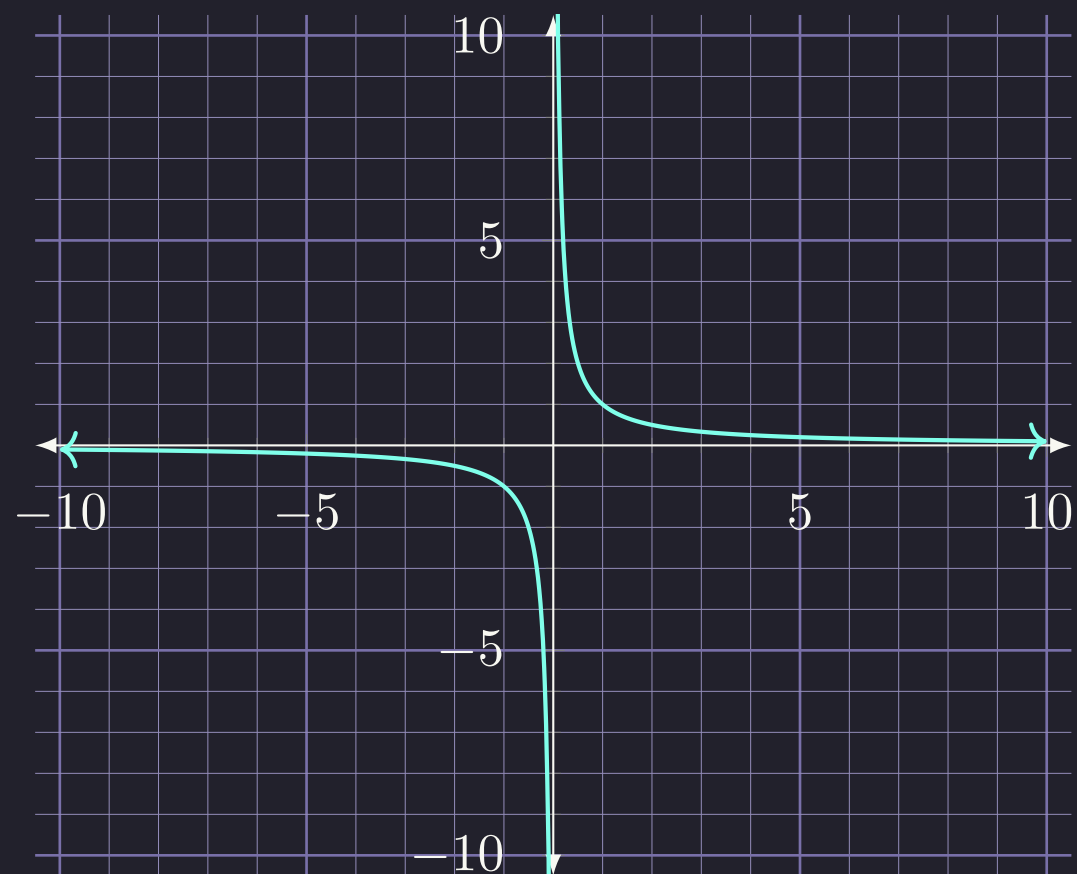
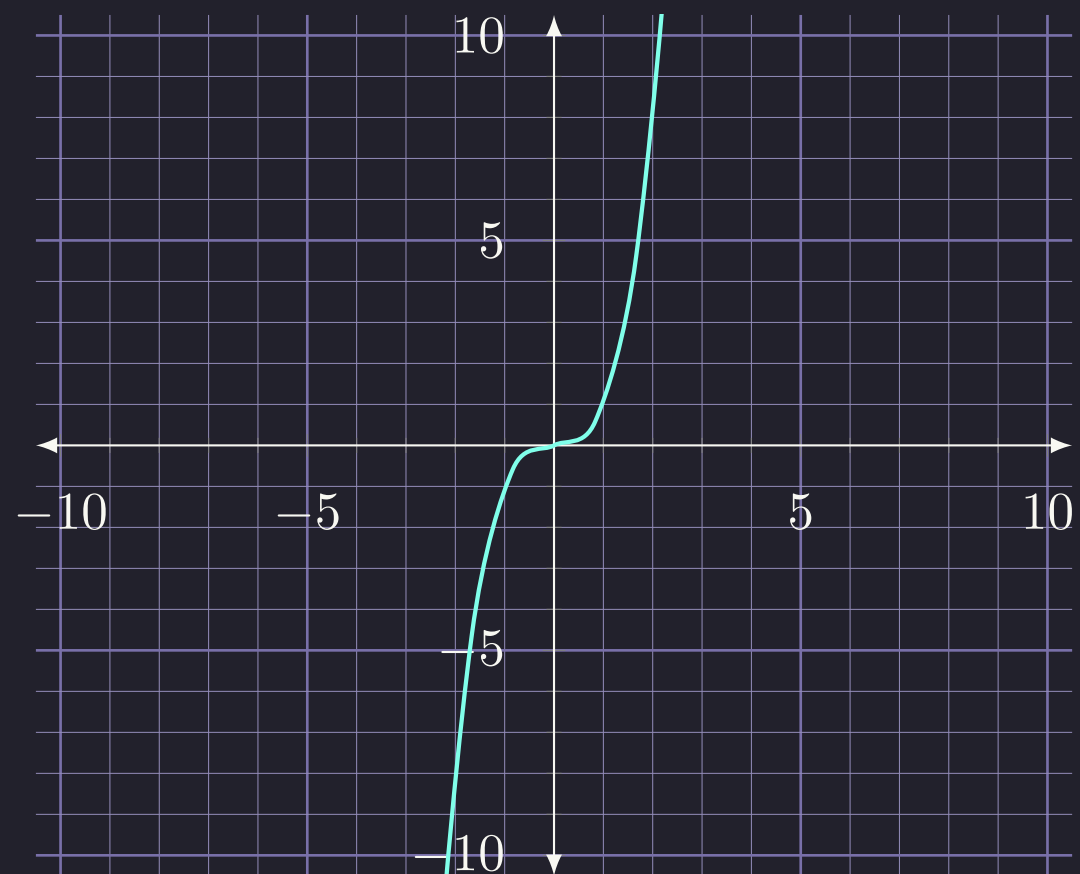






"Parent" Functions

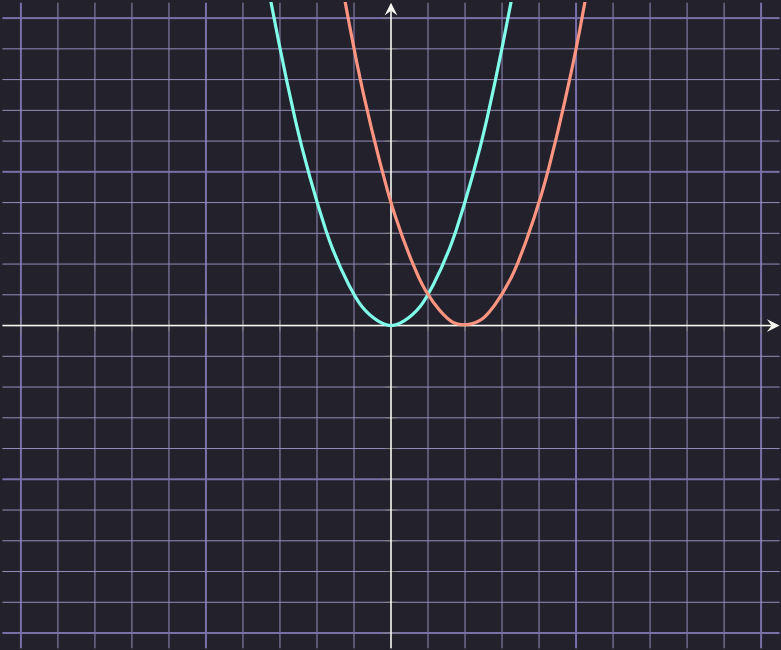




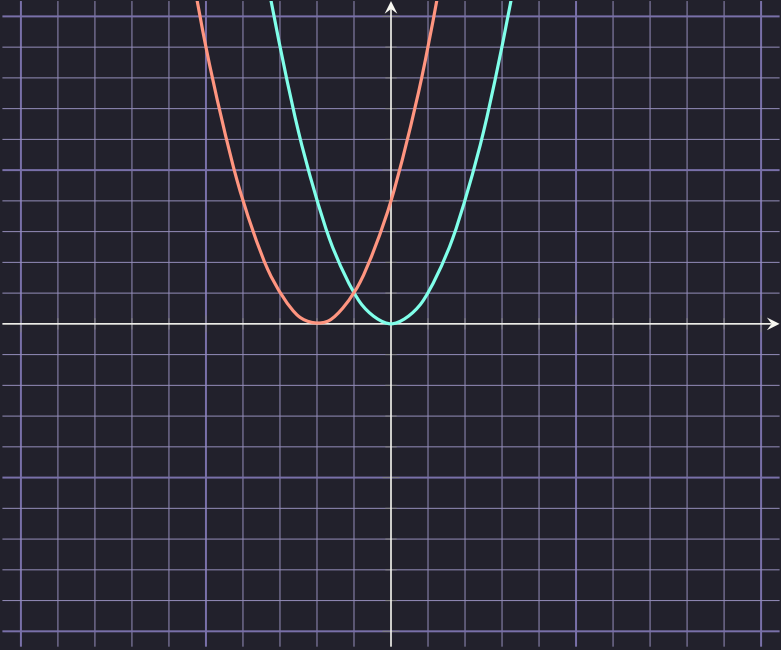
Translation of functions

Shifts:

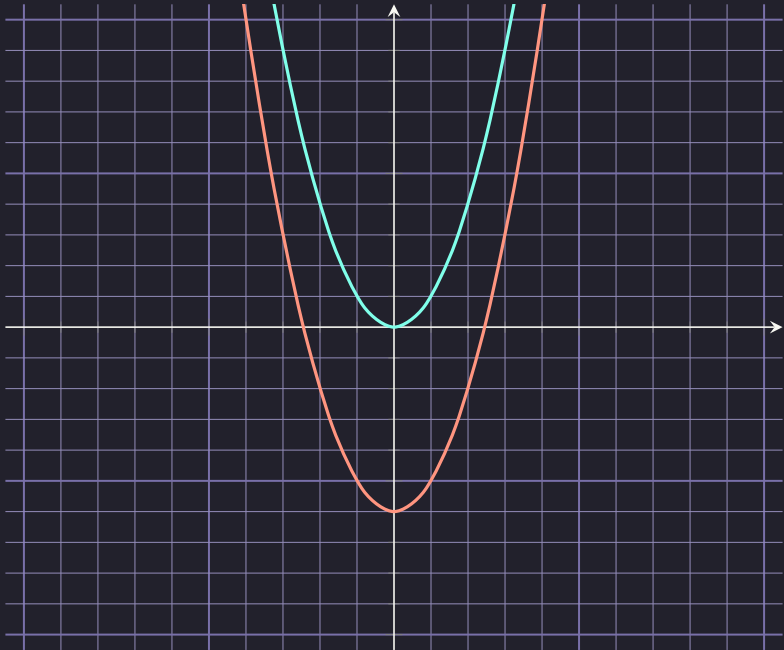
_____ : $f(x) \rightarrow f(x - c)$



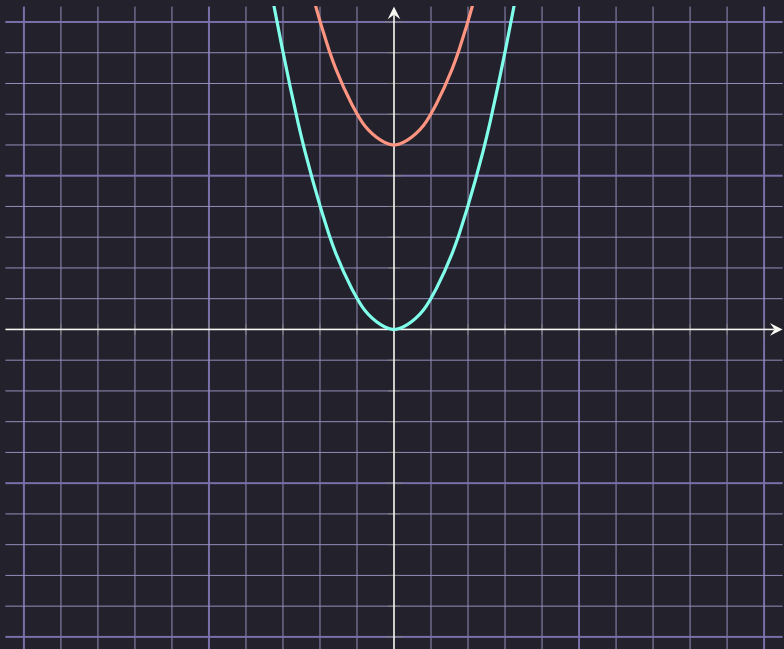
_____ : $f(x) \rightarrow f(x + c)$



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



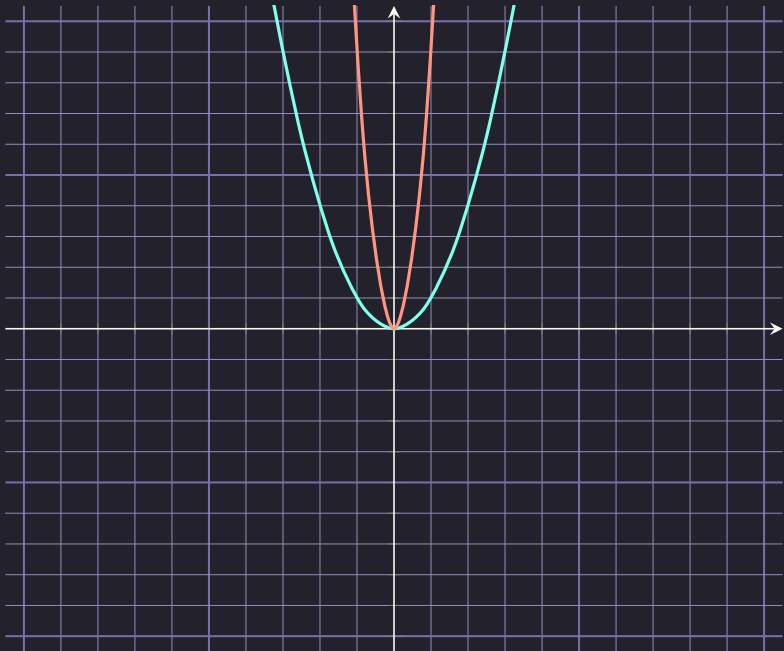
_____ : $f(x) \rightarrow f(x) + c$



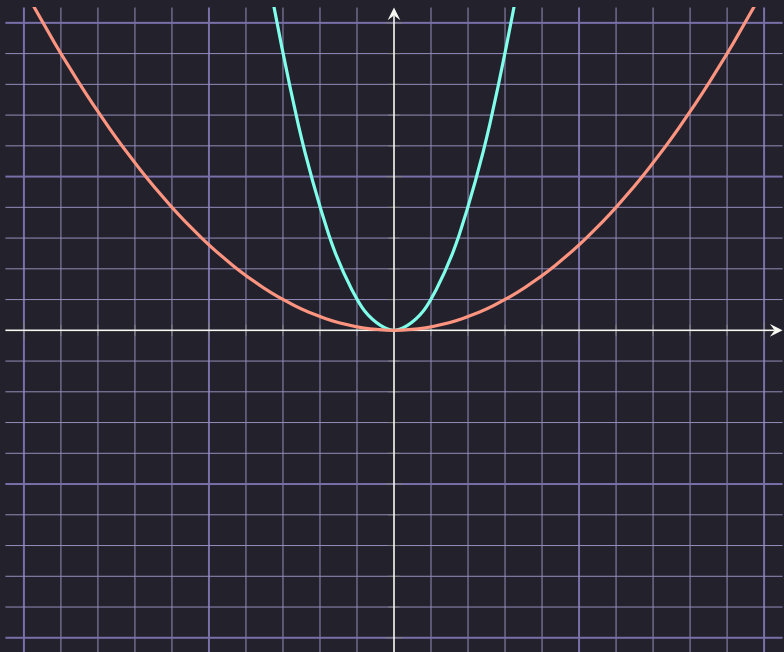
Stretching and reflection:

For $1 < c$

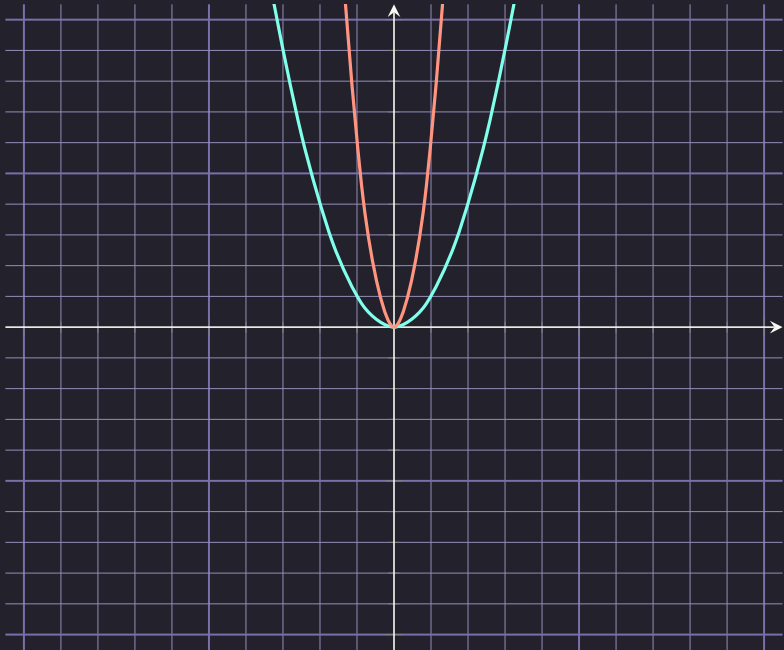
_____ : $f(x) \rightarrow f(cx)$



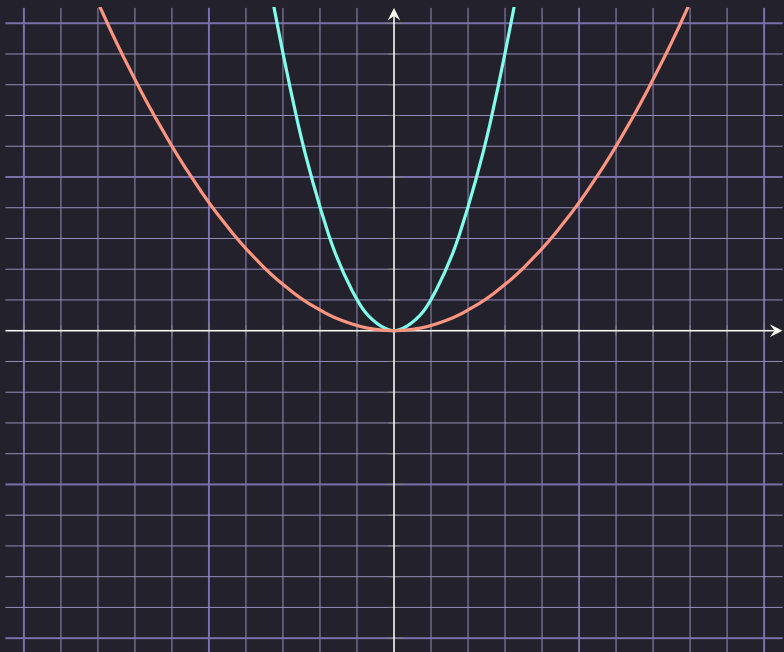
_____ : $f(x) \rightarrow f(\frac{1}{c}x)$



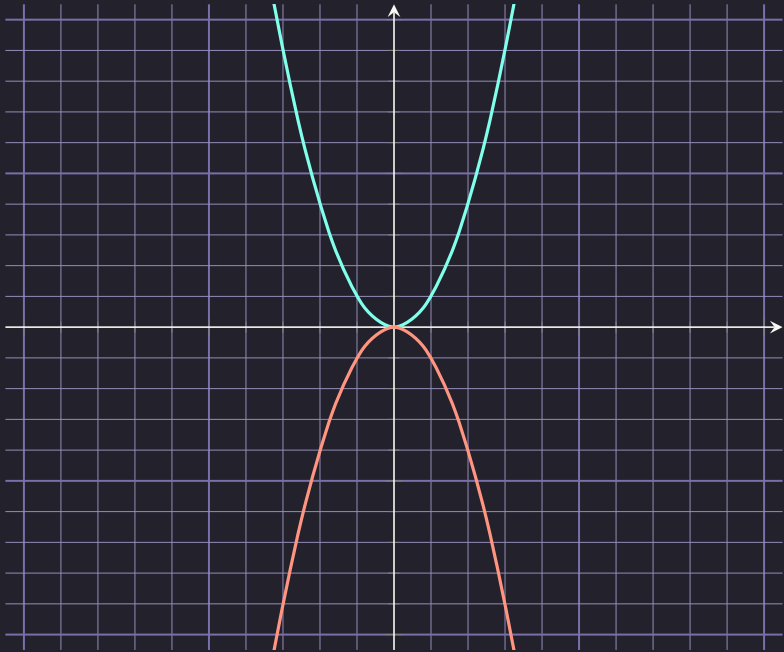
_____ : $f(x) \rightarrow cf(x)$



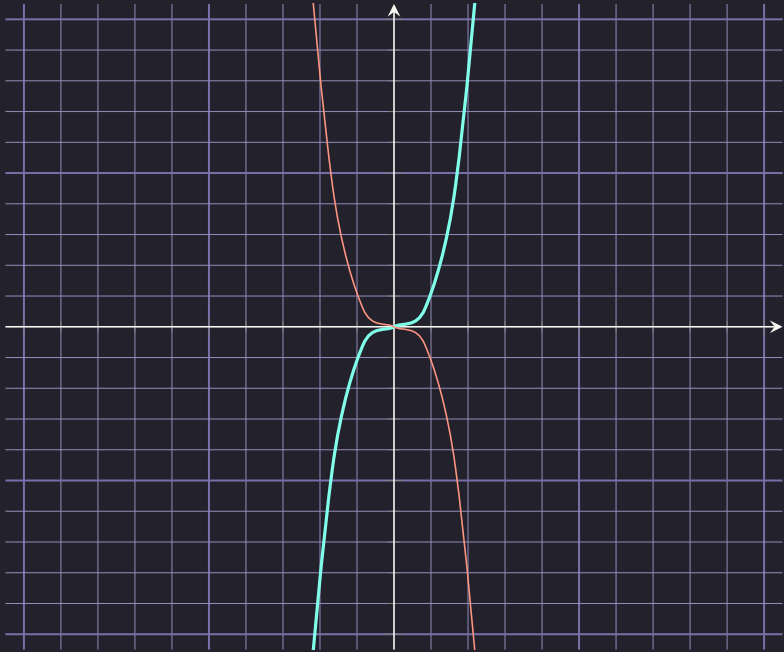
_____ : $f(x) \rightarrow \frac{1}{c}f(x)$



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



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



Function Composition

We let $f(x)$ and $g(x)$ be two functions with "compatible" domain and codomain

the composition of $f(x)$ and $g(x)$ written

$$(f \circ g)(x)$$

is defined to be

$$f(g(x))$$



