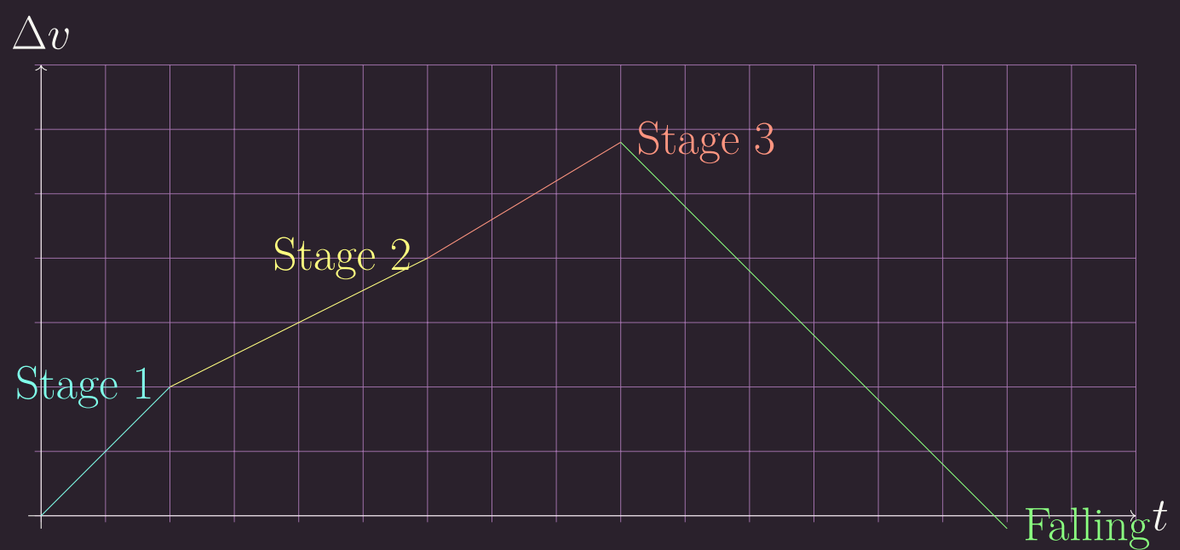
Types of Functions

Piecewise Functions

Notation

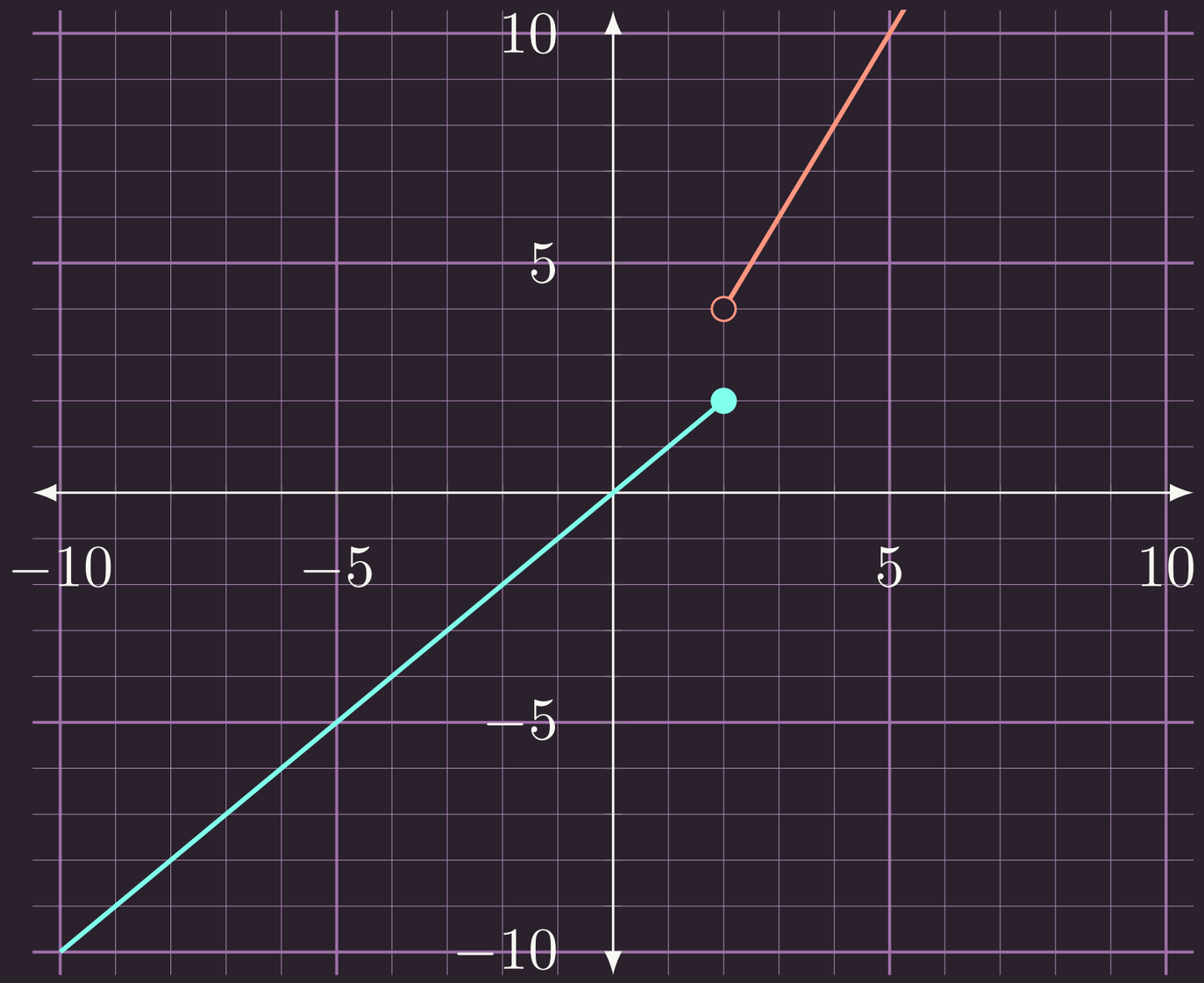
$$f(x) = \begin{cases} \text{function}, & \text{condition} \\ \vdots & \vdots \\ \text{function}, & \text{condition} \end{cases}$$

Example:



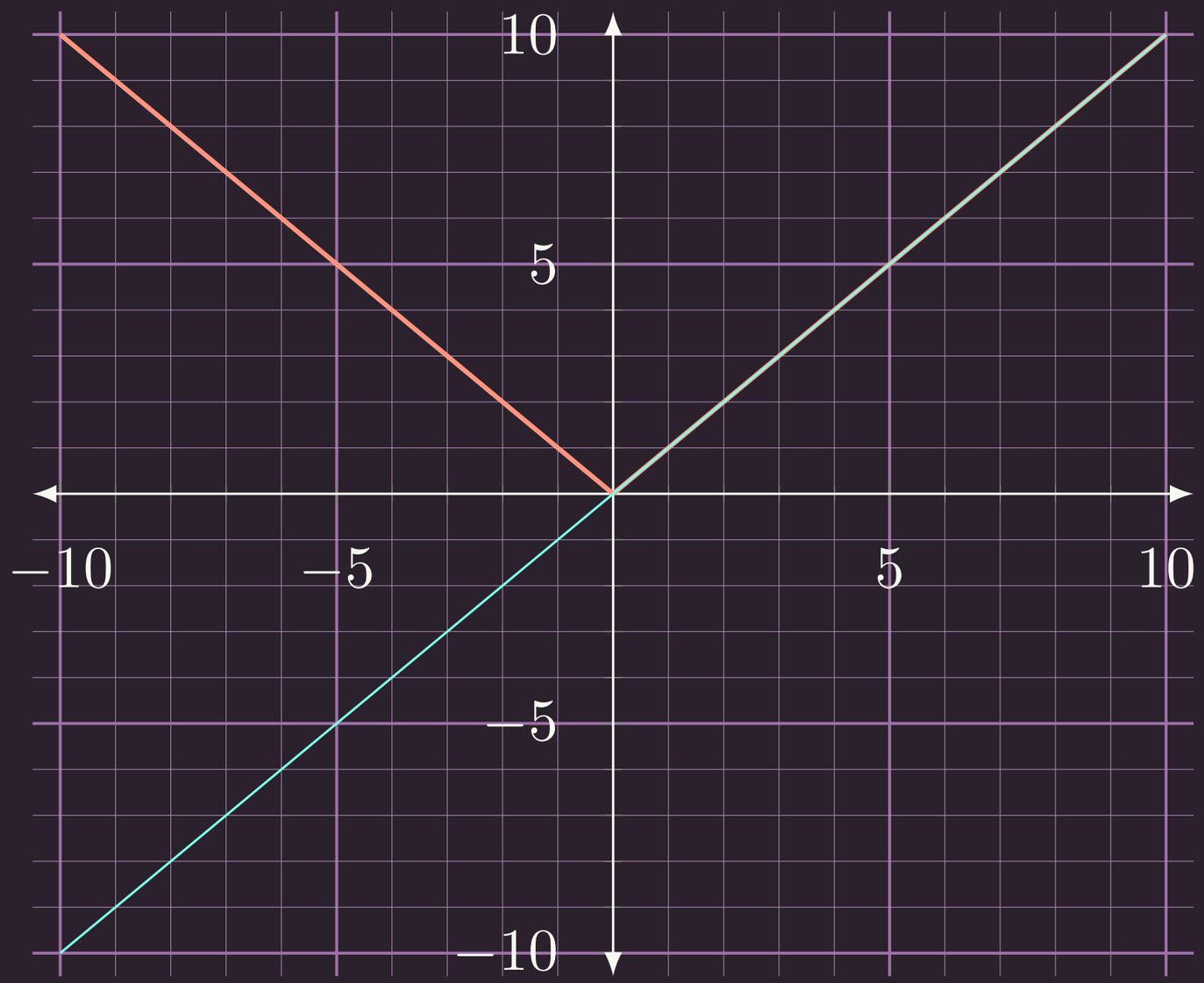
$$f(x) = \begin{cases} x, & [0, 2) \\ \frac{1}{2}x, & (2, 6] \\ \frac{3}{5}x, & (6, 9] \\ -x, & (9, 15] \end{cases}$$

Example:

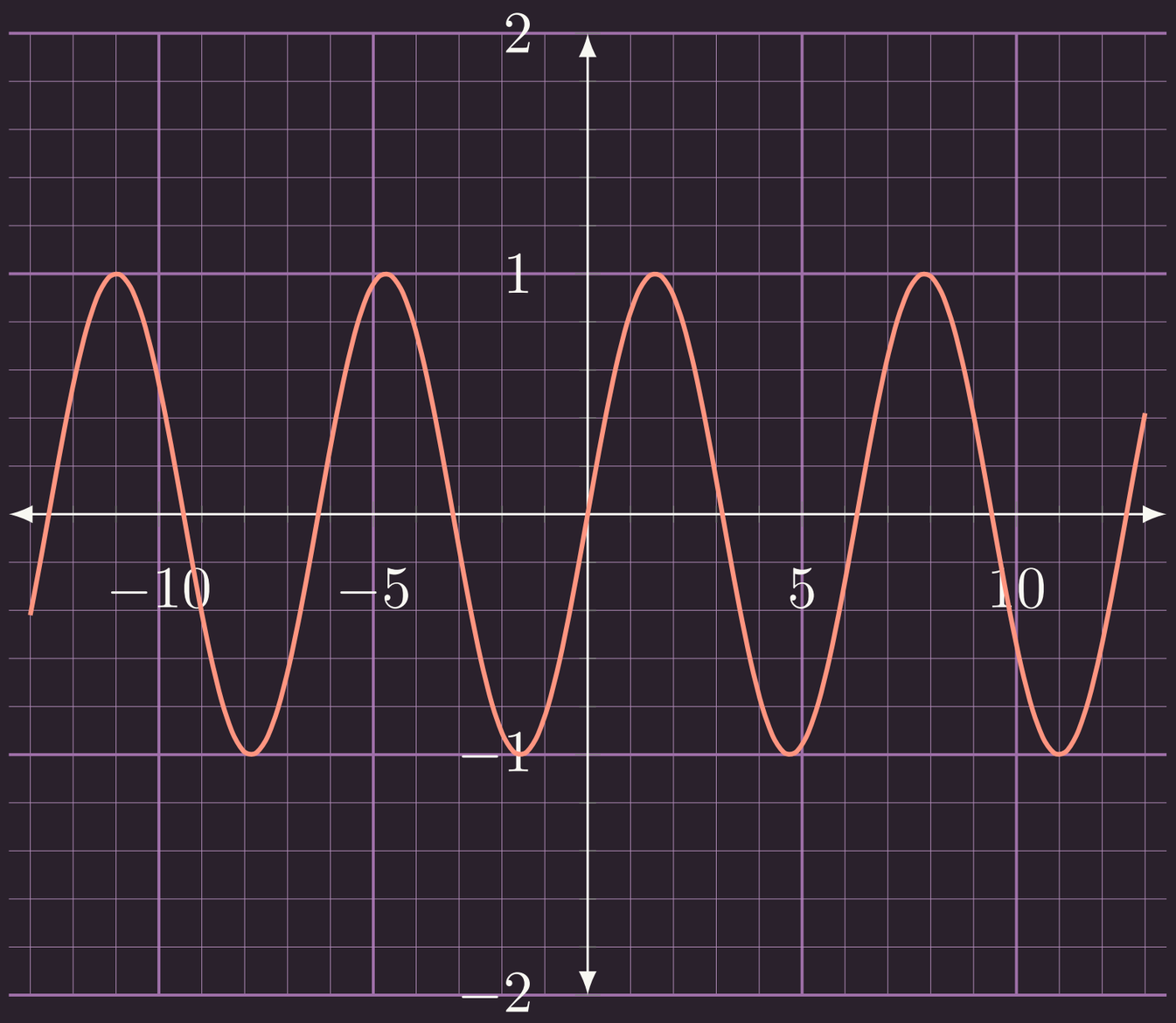


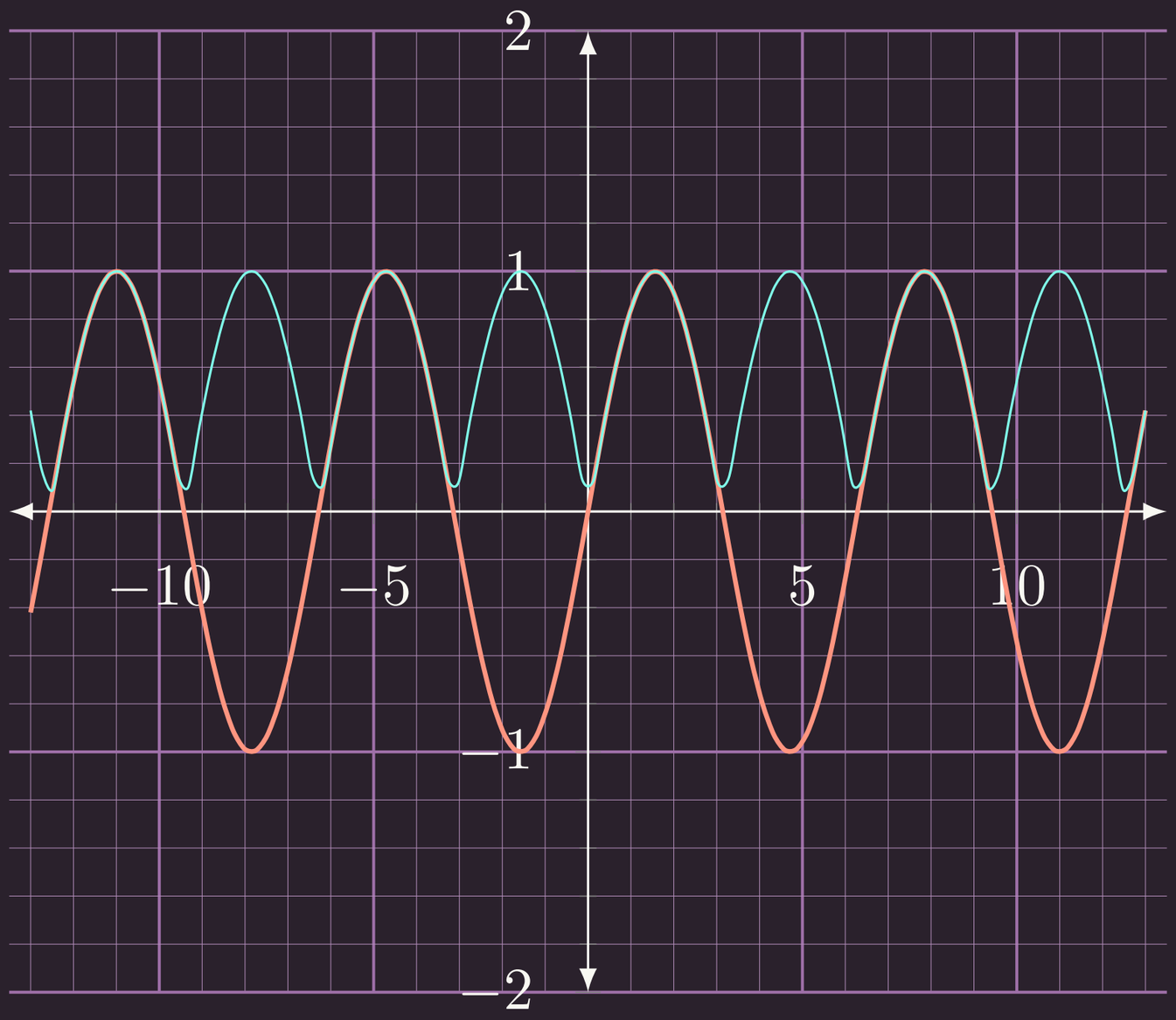
Absolute Value

Example:



Example:




2
1
−10
−5
5
10
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Even and Odd

Definition:

A function $f(x)$ is called:

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

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

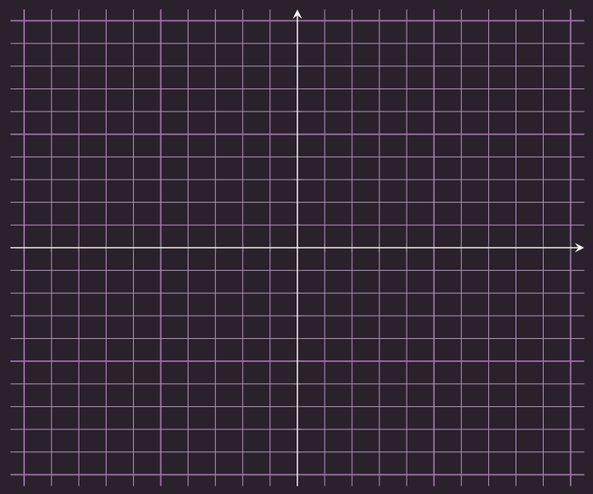
Neither:

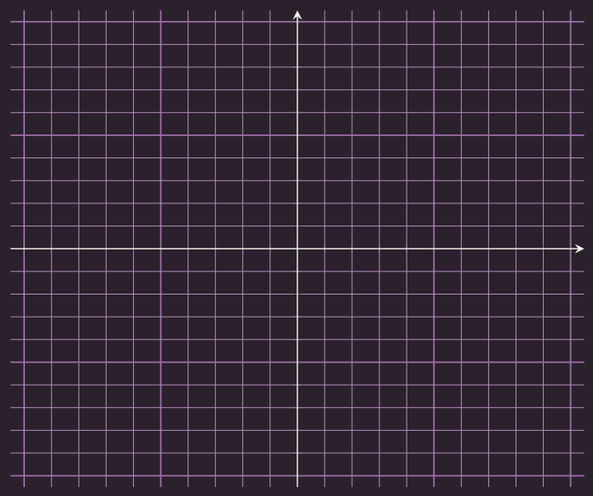
Symmetries:

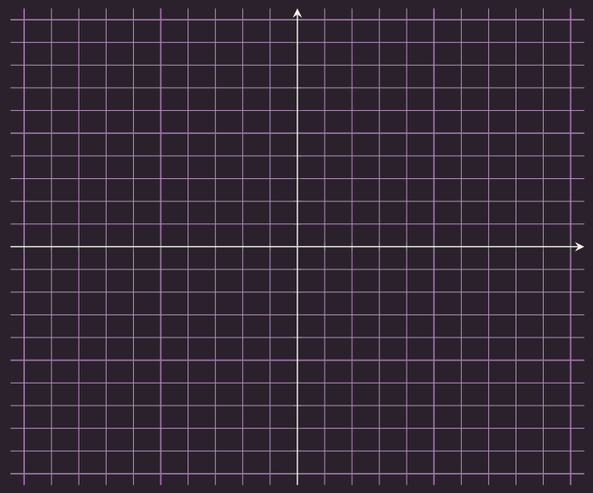
Even:

Odd:

Neither:







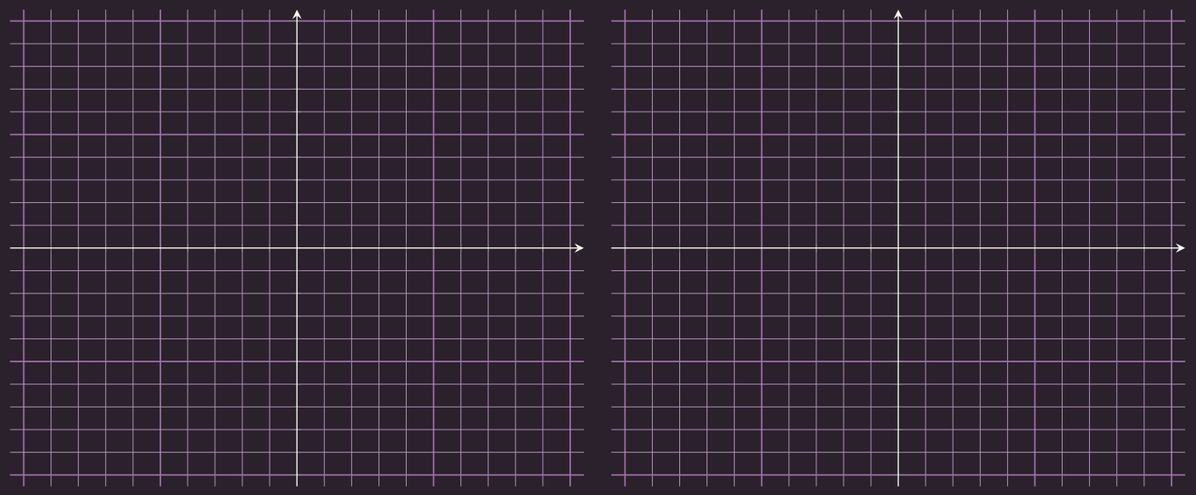
Increasing Decreasing

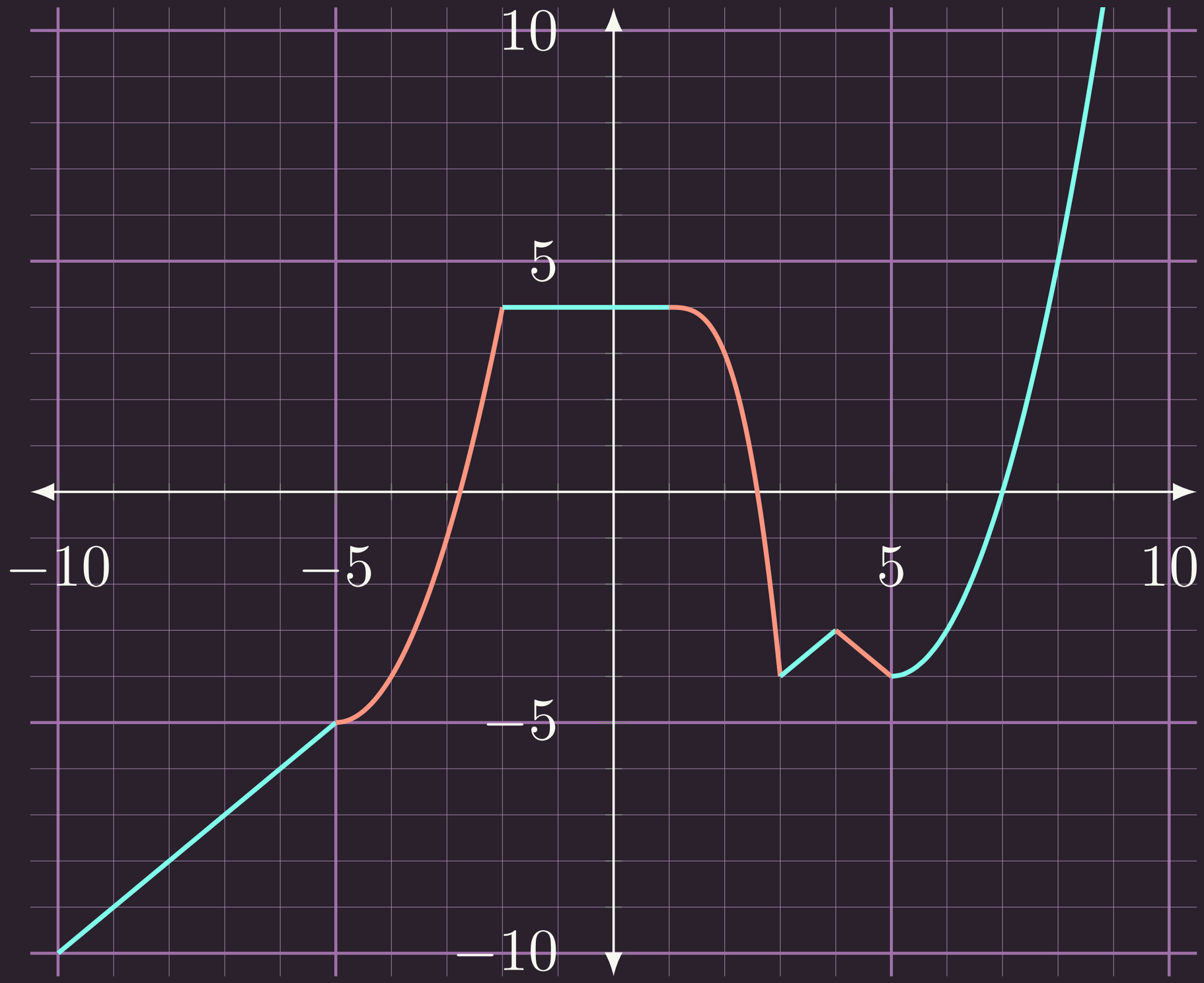
Definition:

A function $f(x)$ on an inteval 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 $f(a) > f(b)$

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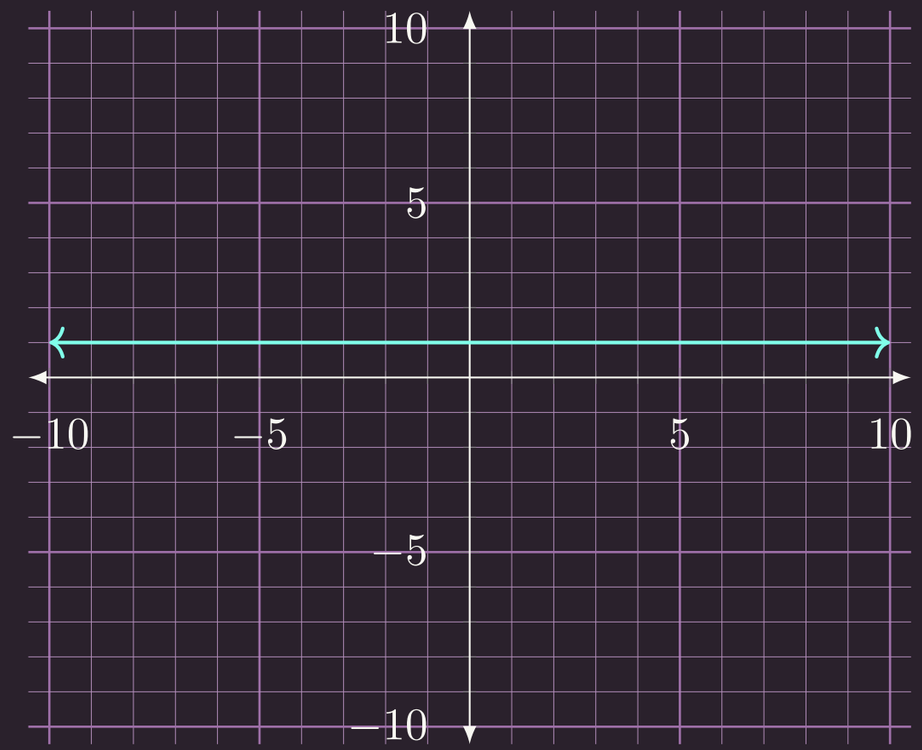
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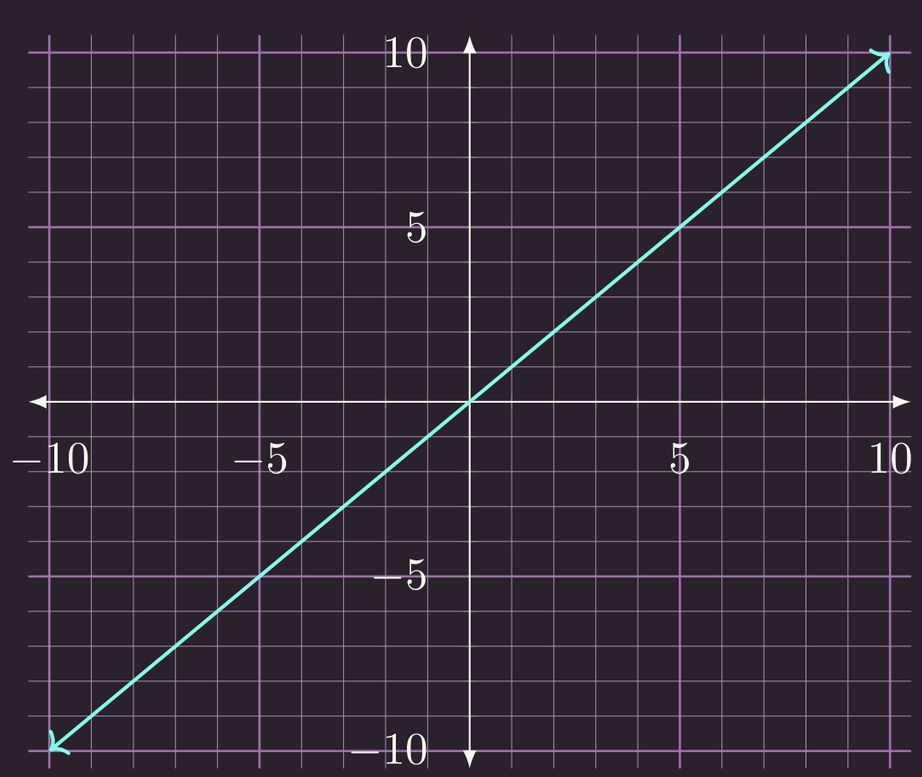
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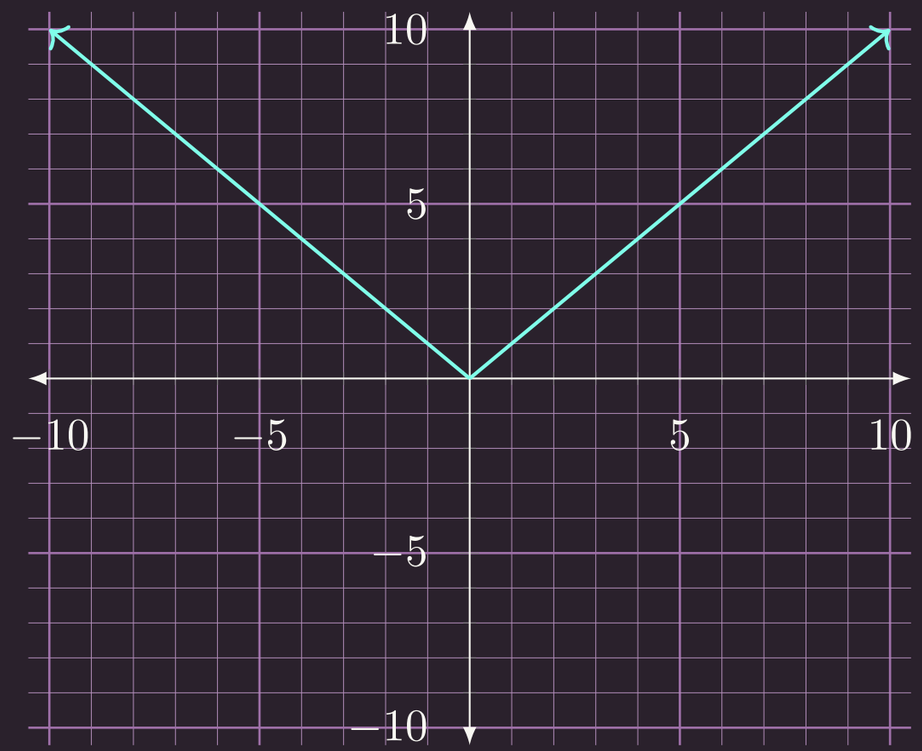
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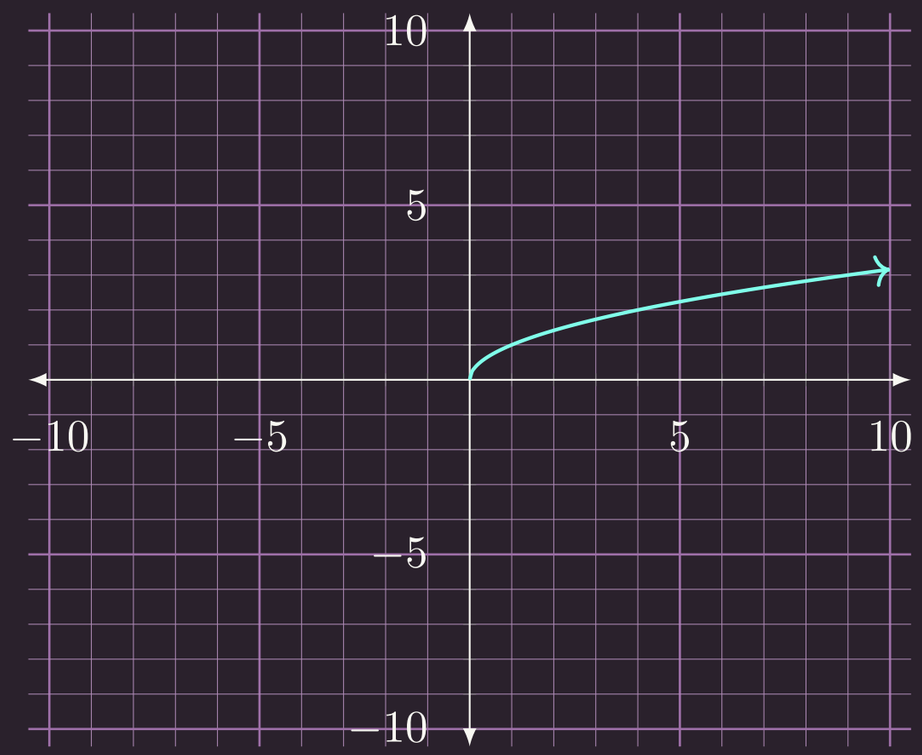
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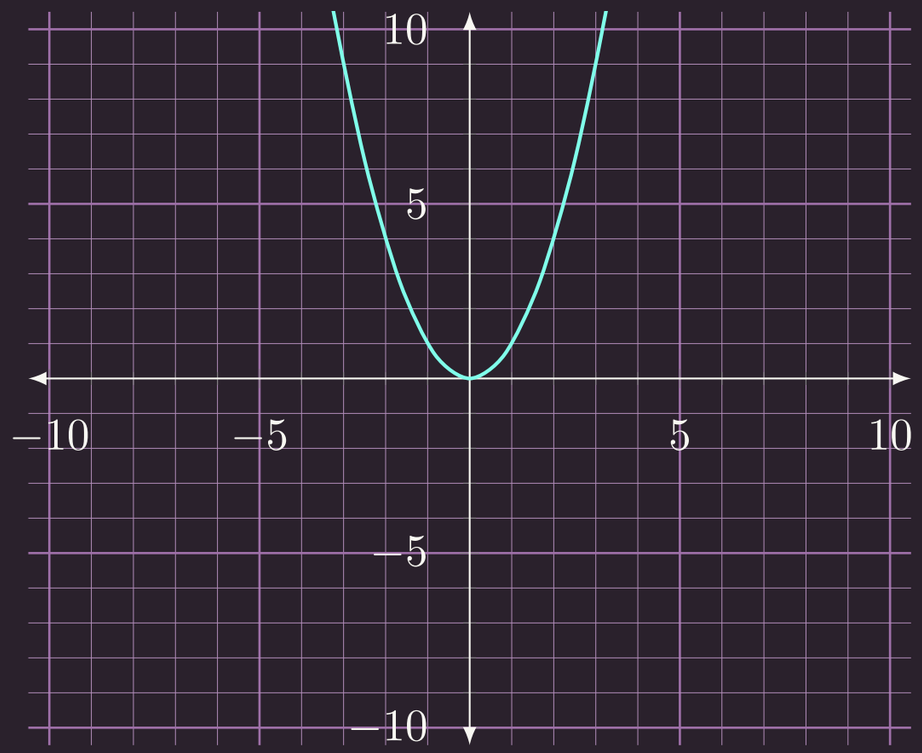
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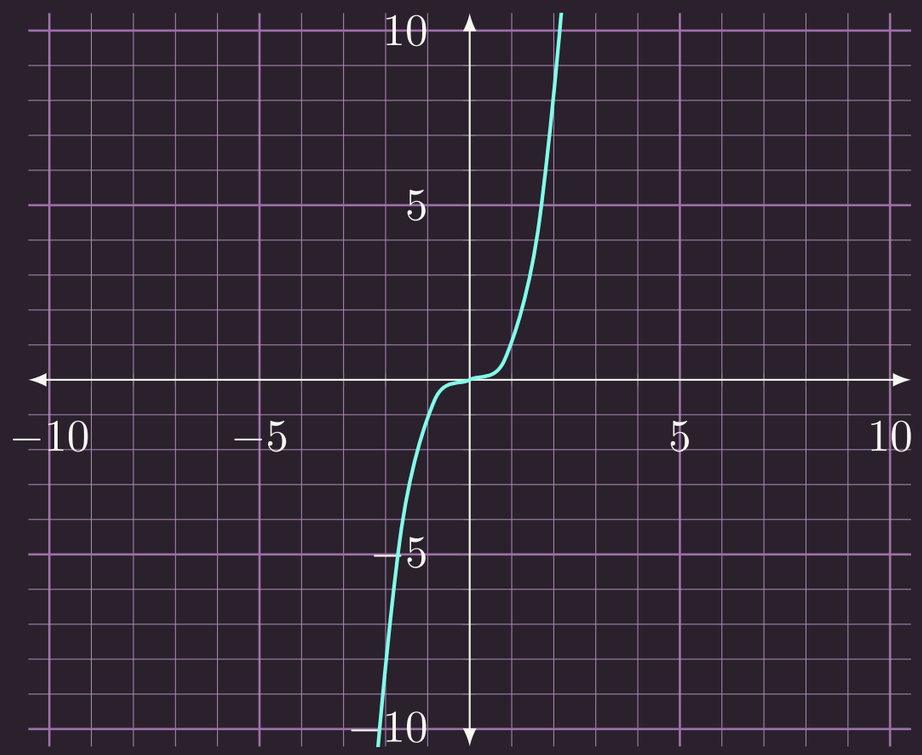
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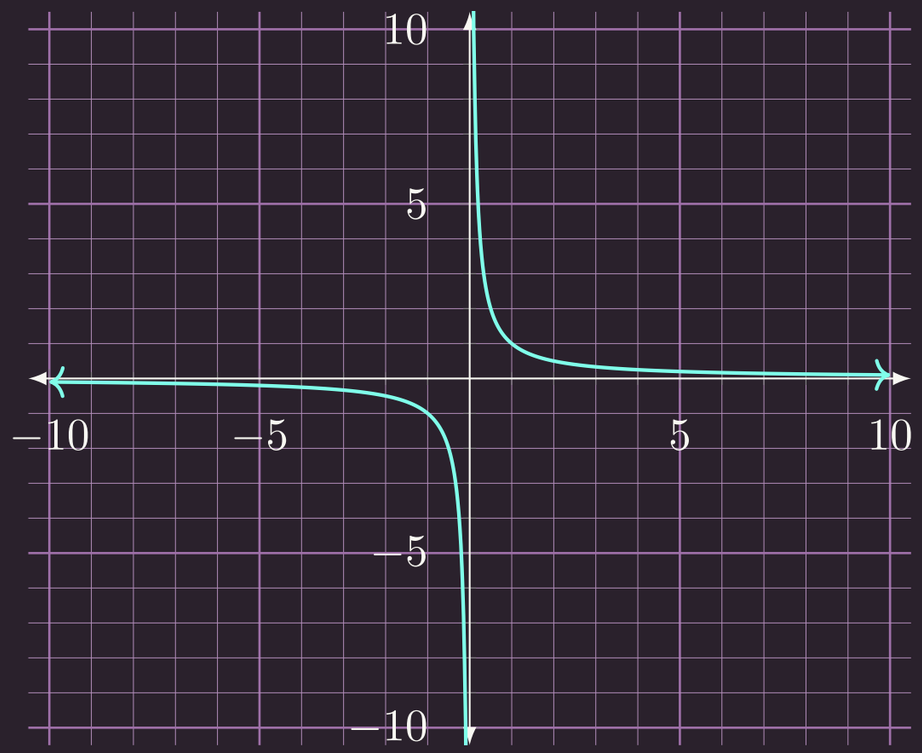
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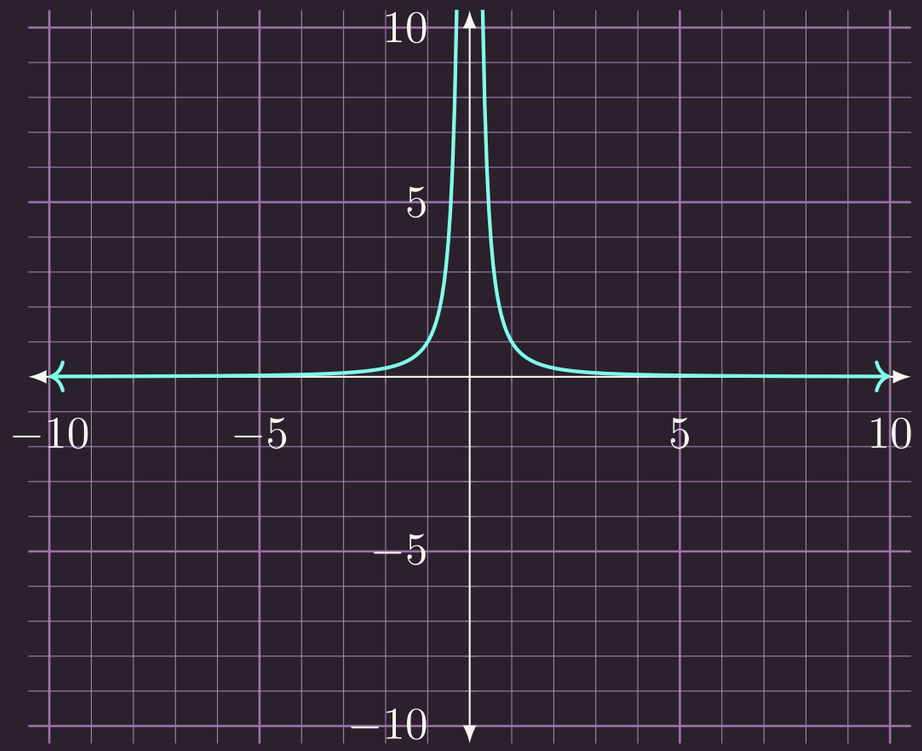
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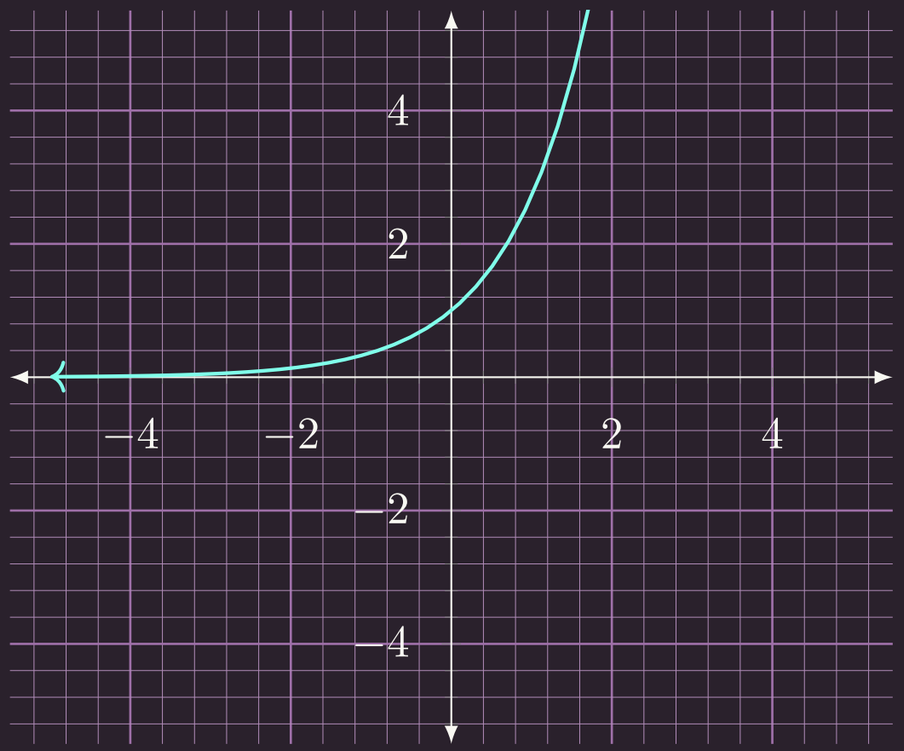
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