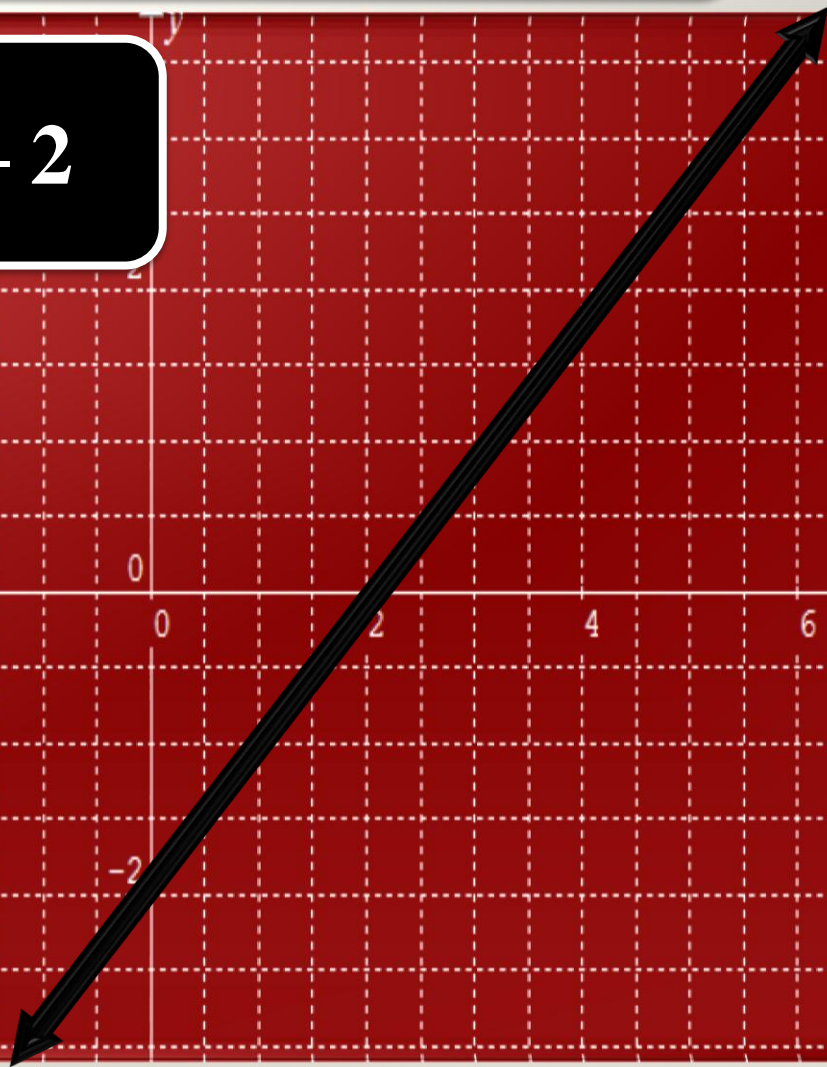


Special Functions

Piecewise-Defined Function

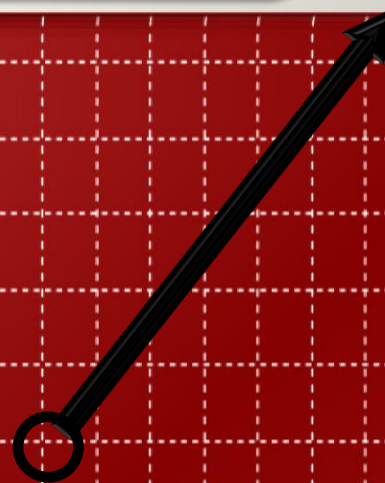
Graph $f(x) = x - 2$



Piecewise-Defined Function

Graph $f(x) = x - 2$

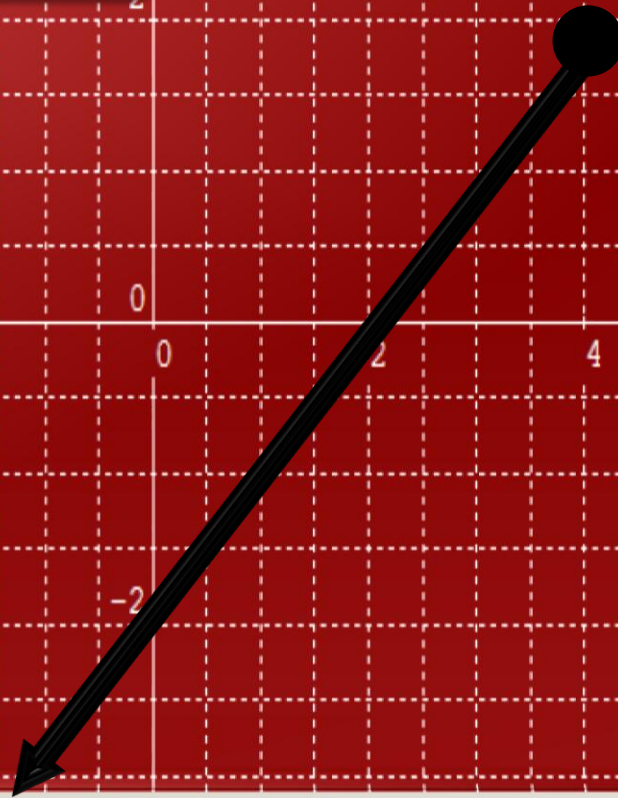
Only for $x > 3$



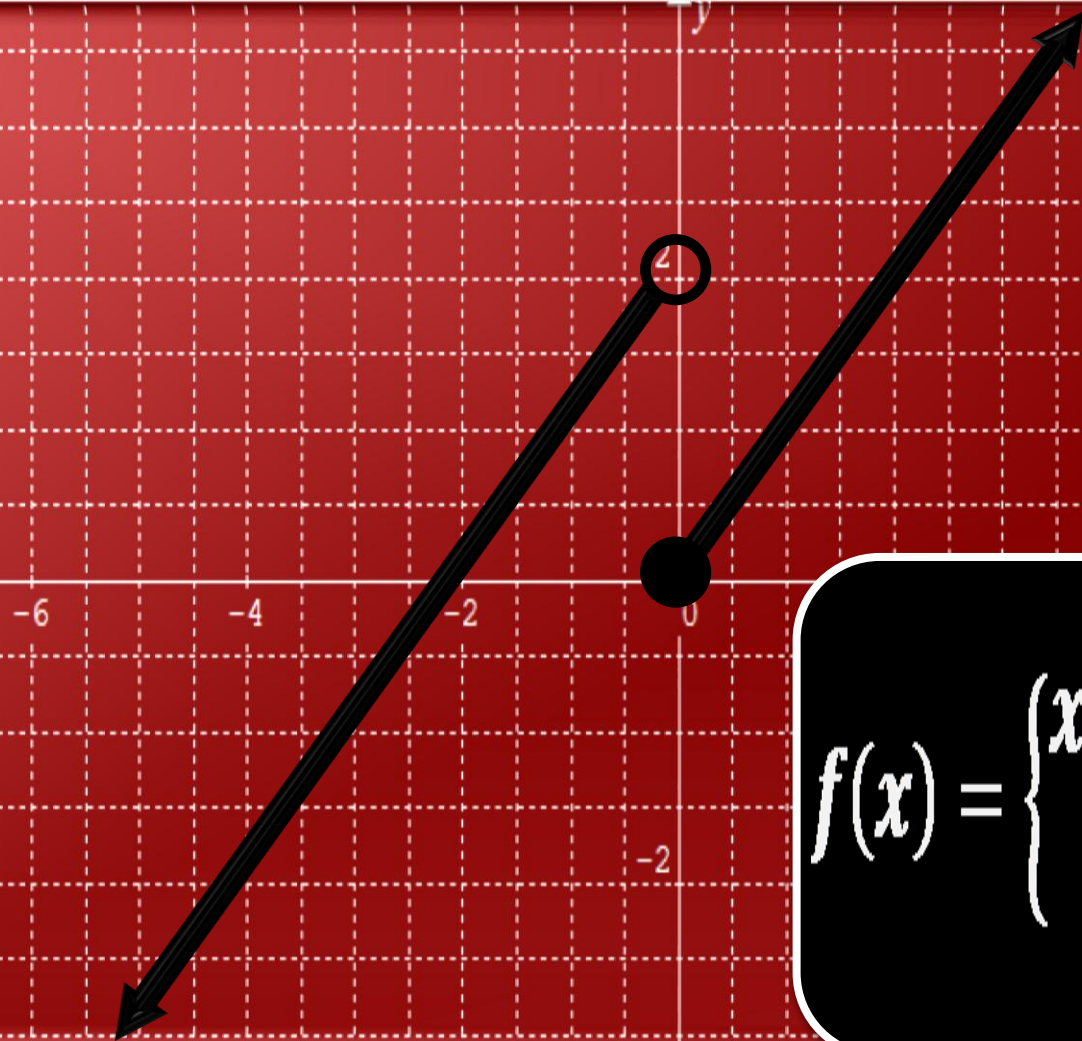
Piecewise-Defined Function

Graph $f(x) = x - 2$

Only for $x \leq 4$

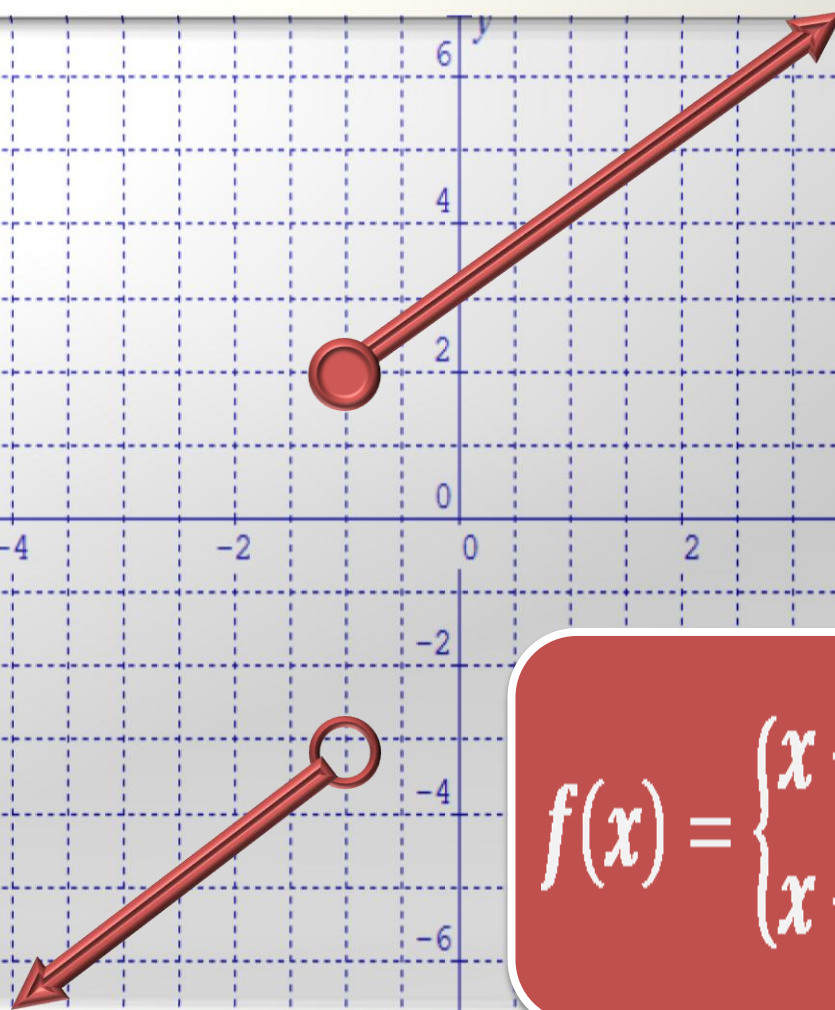


Piecewise-Defined Function



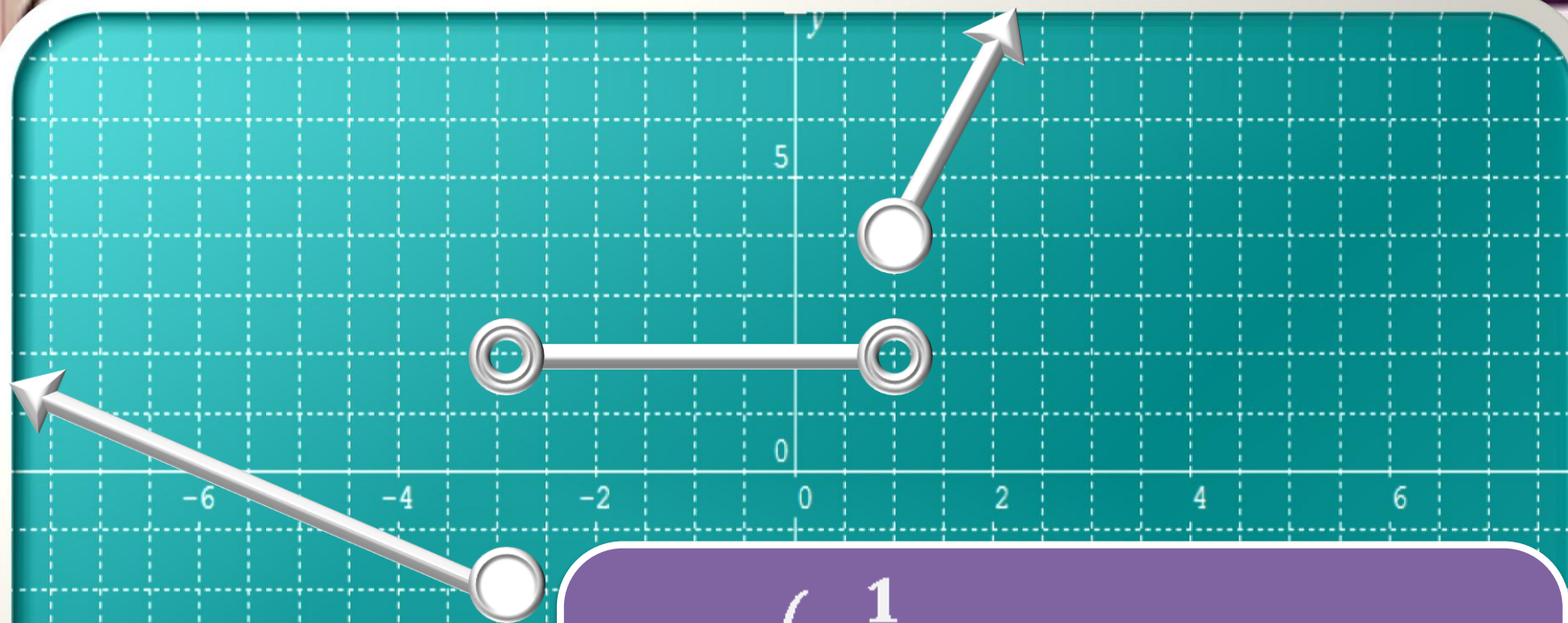
$$f(x) = \begin{cases} x + 2 & \text{if } x < 0 \\ x & \text{if } x \geq 0 \end{cases}$$

Piecewise-Defined Function



$$f(x) = \begin{cases} x - 2 & \text{if } x < -1 \\ x + 3 & \text{if } x \geq -1 \end{cases}$$

Piecewise-Defined Function



$$f(x) = \begin{cases} -\frac{1}{3}x - 2 & \text{if } x \leq -3 \\ 2 & \text{if } -3 < x < 1 \\ 3x + 1 & \text{if } x \geq 1 \end{cases}$$



**Step
Functions**

And

**Absolute Value
Functions**

Greatest Integer Function

$$f(x) = \lfloor x \rfloor$$

*The greatest integer less
than or equal to x*

Greatest Integer Function

$$f(2.2)$$

$$f(2.2) = \llbracket 2.2 \rrbracket = 2$$

$$f(3.78)$$

$$f(3.78) = \llbracket 3.78 \rrbracket = 3$$

$$f(-6.7)$$

$$f(-6.7) = \llbracket -6.7 \rrbracket = -7$$

$$f(-0.9)$$

$$f(-0.9) = \llbracket -0.9 \rrbracket = -1$$

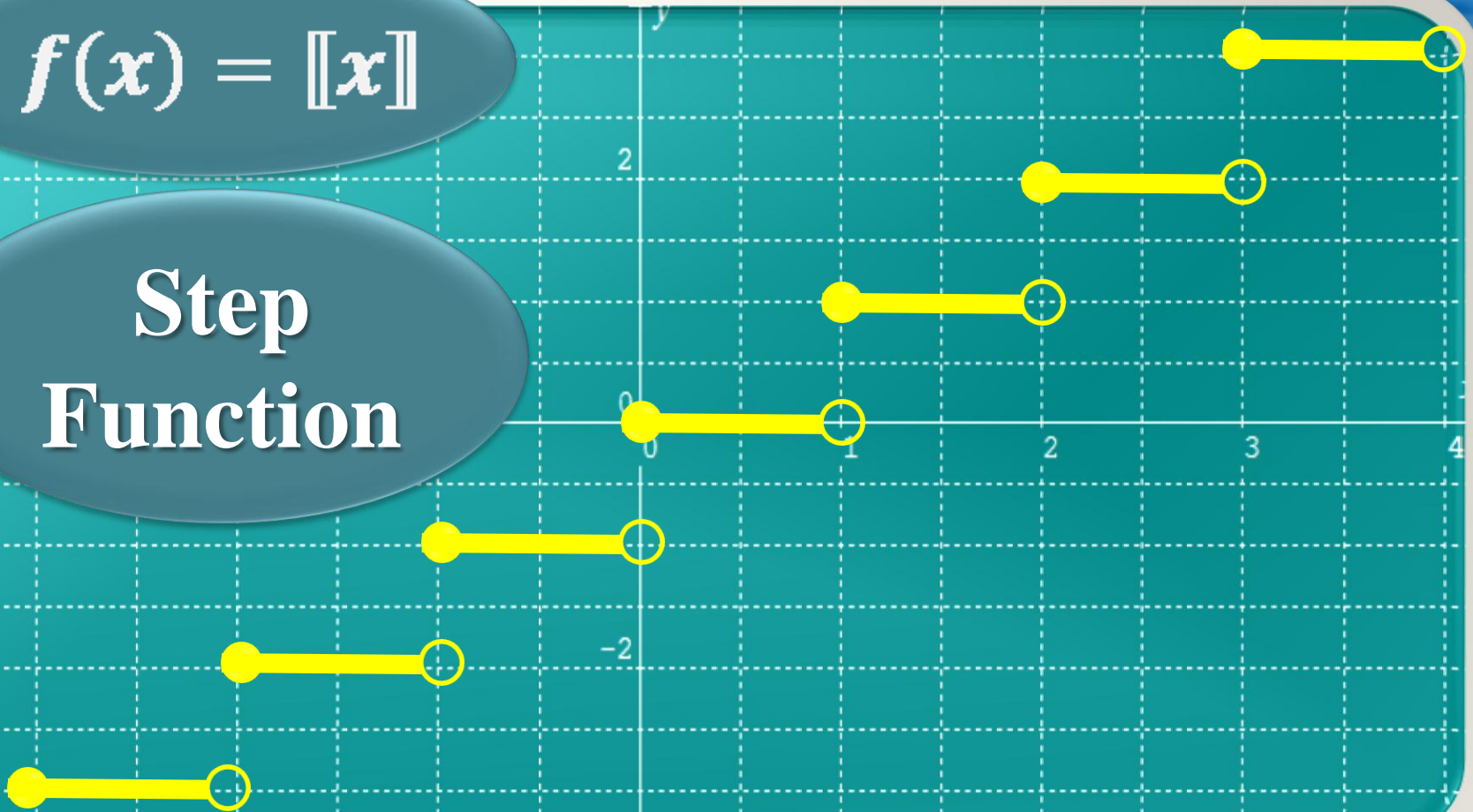
$$f\left(5\frac{3}{7}\right)$$

$$f\left(5\frac{3}{7}\right) = \llbracket 5\frac{3}{7} \rrbracket = 5$$

Greatest Integer Function

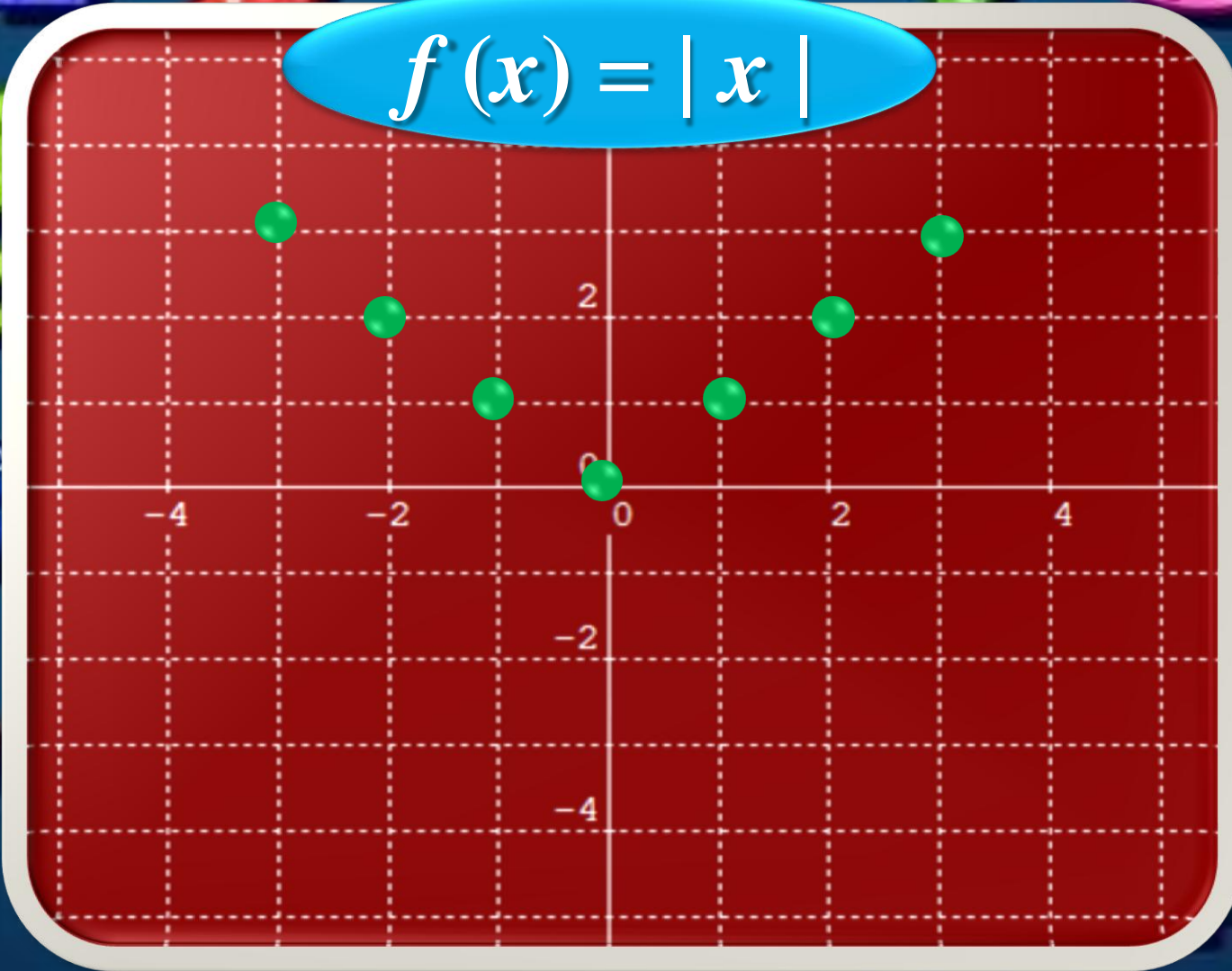
$$f(x) = \llbracket x \rrbracket$$

Step Function



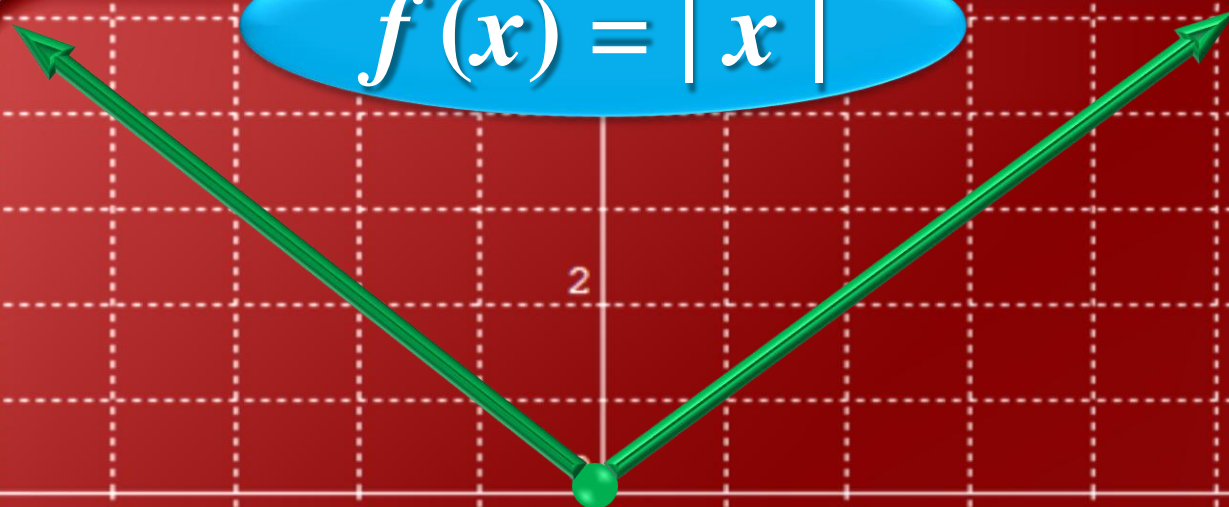
Absolute Value Functions

$$f(x) = |x|$$



Absolute Value Functions

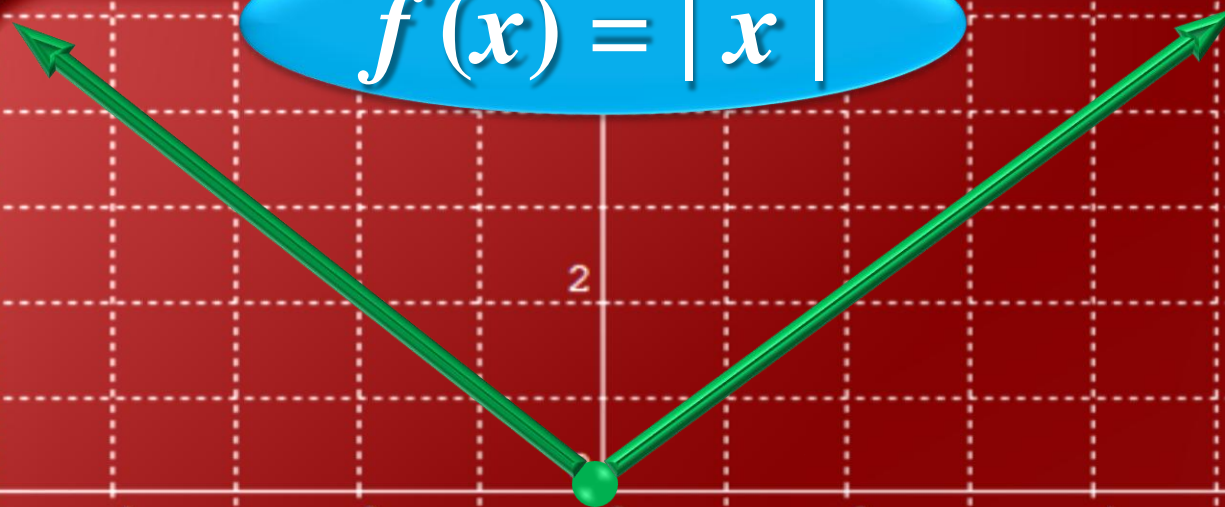
$$f(x) = |x|$$



$$f(x) = \begin{cases} x & \text{if } x > 0 \\ 0 & \text{if } x = 0 \\ -x & \text{if } x < 0 \end{cases}$$

Absolute Value Functions

$$f(x) = |x|$$



Domain : All real numbers

Range : $\{f(x) \mid f(x) \geq 0\}$