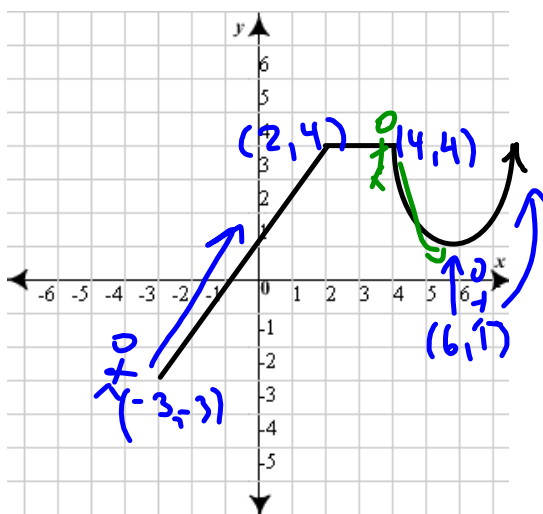


Variation of a Function



To determine the intervals of variation, read only the **x-axis!**

Consider the above function f :

- f is **constant** over: $[2, 4]$
- f is **increasing** over: $f \uparrow$ over $[-3, 2] \cup [6, \infty[$
- f is **decreasing** over: $f \downarrow$ over $[4, 6]$

Maximum and Minimum of a Function

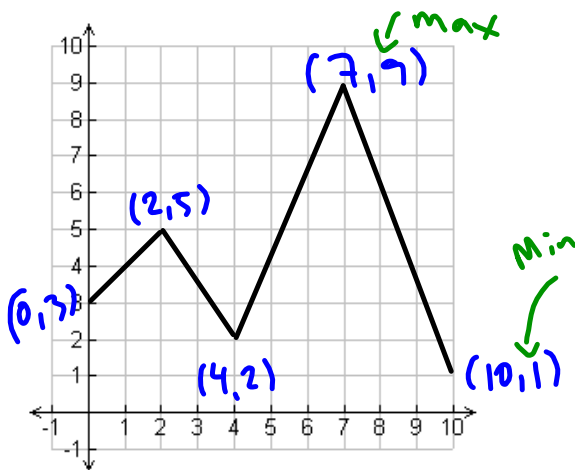
Absolute Maximum:

- Greatest y value (if it exists)

Absolute Minimum:

- Lowest y value (if it exists)

The maximum and minimum are called **extrema**



Absolute Maximum:

$$\underline{\underline{\max f = 9}}$$

Absolute Minimum:

$$\min f = 1$$

Relative Maximum:

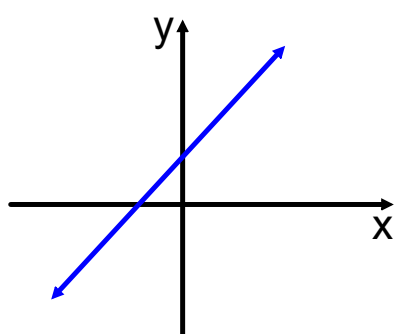
$$\text{rel max } f = 5$$

Relative Minimum:

$$\text{rel min } f = 2$$

Sometimes a max and/or min do not exist.

For example:



This is a continuous function,
so there is no max and min.

\therefore No Extrema