

2.2 Domain Range End Behavior

Domain: the set of x-values

↳ determined by reading a graph from **LEFT** to **RIGHT**

Range: the set of y-values

↳ read the graph from **BOTTOM** to **TOP**

Domain and Range must be stated in **set** or **interval** notation.

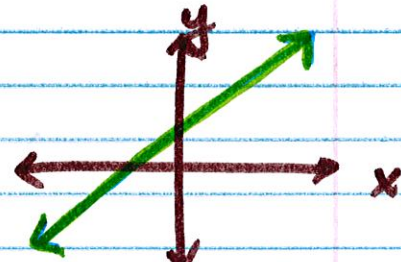
↳ parentheses $()$ - not included
open circles \circ
brackets $[]$ - included
closed circles \bullet
for $-\infty$ or ∞ use $()$

Examples

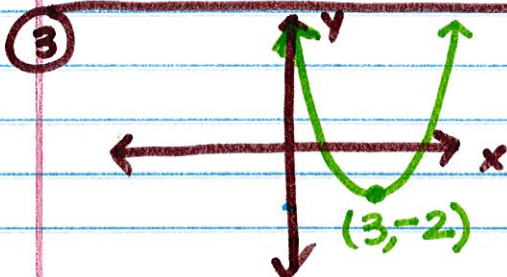
① Function: $\{(0,3)(1,8)(2,5)\}$ ②

Domain: $\{0,1,2\}$

Range: $\{3,5,8\}$



Domain: $(-\infty, \infty)$ $\{x \in \mathbb{R}\}$
Range: $(-\infty, \infty)$ $\{y \in \mathbb{R}\}$



Domain: $(-\infty, \infty)$ $\{x \in \mathbb{R}\}$
Range: $[-2, \infty)$ $\{y \geq -2\}$

End Behavior: What are the ends doing?
How are they acting?

Most times, they are going to infinity,
negative infinity or getting close to
an asymptote.

infinity



negative infinity



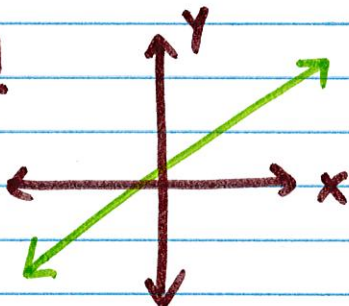
close to an
asymptote



"leveling off"

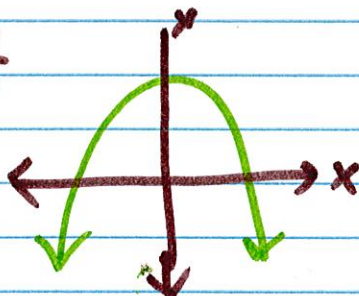
Notation: As $x \rightarrow -\infty$, $y \rightarrow$ _____ (left end)
As $x \rightarrow \infty$, $y \rightarrow$ _____ (right end)

EX.1



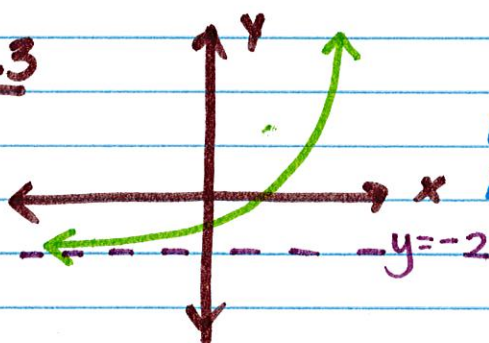
As $x \rightarrow -\infty$, $y \rightarrow -\infty$
As $x \rightarrow \infty$, $y \rightarrow \infty$

EX.2



As $x \rightarrow -\infty$, $y \rightarrow -\infty$
As $x \rightarrow \infty$, $y \rightarrow -\infty$

EX.3



As $x \rightarrow -\infty$, $y \rightarrow -2$
As $x \rightarrow \infty$, $y \rightarrow \infty$