

DOMAIN:

- **Precise definition:** For a function f , which is a rule that assigns to each element x in a set D exactly one element, called $f(x)$ in a set E , then the **domain** of f is the set D .
- **My understanding:** The domain is the set of all x -values that it makes sense to plug into f .
- **Example that shows you understand the definition:** Consider $f(x) = \sqrt{x - 2}$. The only values that can be plugged in for x are those where $x - 2 \geq 0$. In other words, $D = [2, +\infty)$.
- **Non-example that shows you understand the definition:** Consider $f(x) = \sqrt{x - 2}$. The possible y -values are $geq 0$, but $[0, +\infty)$ is the RANGE of the function, not the DOMAIN!

RANGE:

- **Precise definition:** The **range** of f is the set of all possible values of $f(x)$ as x varies throughout the domain.
- **My understanding:** The range is the set of all y -values that are output from f when considering all the inputs to f in its domain.
- **Example that shows you understand the definition:** Consider $f(x) = \sin(x)$ on the domain $(-\infty, +\infty)$. This function can (and DOES) output every value from -1 to 1 and nothing else. So its range is the interval $[-1, 1]$.
- **Non-example that shows you understand the definition:** Consider $f(x) = \sin(x)$. The possible x -values you can plug into the function are $(-\infty, +\infty)$, but that is the DOMAIN of the function, not the RANGE!