- A function is a conceptual machine that eats an input and gives you back an output. It always gives you the same output when you feed it the same input.

- A real world function: temperature at Fairbanks International Airport as a function of day and time.

- Mathematical functions model real world functions.

- In our class, functions eat a real number and give you back a real number as its output.

- Examples of mathematical functions:

  - $f(x) = 1/x$
  - $g(h) = \cos\left(\dfrac{x-3}{7}\right)$
  - $p(x) = 3x^4 - 2x + 9$

- **Domain**: The allowed set of inputs to a function

- **Range**: For our class, the set of all possible outputs of a function.

- Just one real number as output for us: $\sqrt{9} = 3$. Not ± 3.

- Functions can be defined piecewise. Here's a really important one.

$$|x| = \begin{cases} x & x \geq 0 \\ -x & x < 0 \end{cases}$$