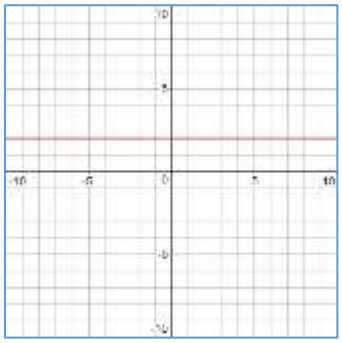
Math 1508

Parent functions

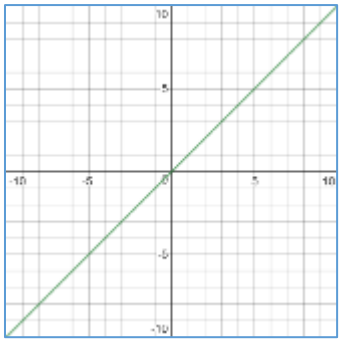
The constant function, $f(x) = c$, where c is a constant.

- Graph is a horizontal line.
- Slope is $m = 0$



The identity (linear) function, $f(x) = x$.

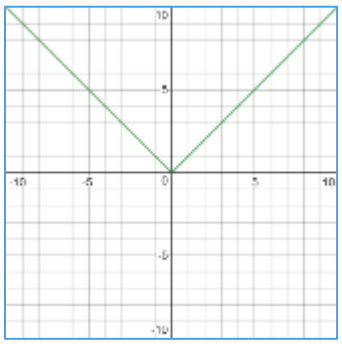
- Domain: $(-\infty, \infty)$
- Range: $(-\infty, \infty)$



The absolute value function, $f(x) = |x|$.

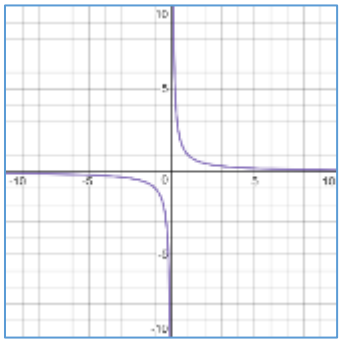
Also given by $f(x) = \begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}$

- Domain: $(-\infty, \infty)$
- Range: $[0, \infty)$
- Key point (0,0)



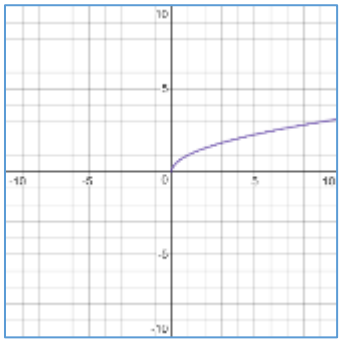
The reciprocal function, $f(x) = \frac{1}{x}$, is also known as the rational function.

- Domain: $(-\infty, 0) \cup (0, \infty)$
- Range: $(-\infty, 0) \cup (0, \infty)$
- Asymptotes at $x = 0$ and $y = 0$.



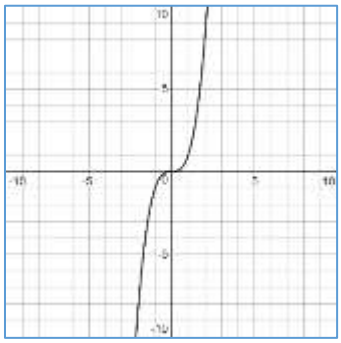
The square root function, $f(x) = \sqrt{x}$.

- Domain: $[0, \infty)$
- Range: $[0, \infty)$
- Key point (0,0)
- Generally increasing



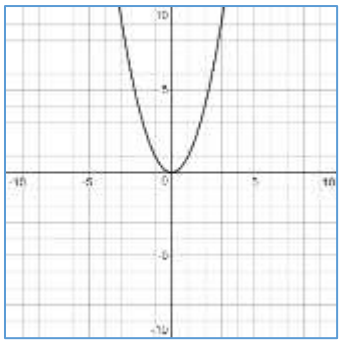
The cubic function, $f(x) = x^3$.

- Domain: $(-\infty, \infty)$
- Range: $(-\infty, \infty)$
- Key point: (0,0)
- Generally increasing



The squaring, or quadratic, function, $f(x) = x^2$.

- Domain: $(-\infty, \infty)$
- Range: $[0, \infty)$
- Key point: (0,0)
- Parabolic → "U-shaped"



The greatest integer function, $f(x) = \|x\|$. Also known as the floor function or in more general terms, a step function.

- Domain: $(-\infty, \infty)$
- Range: $\{z | z \ is \ an \ integer\}$
- Key concept, integer input gives integer output to know where solid dots appear.