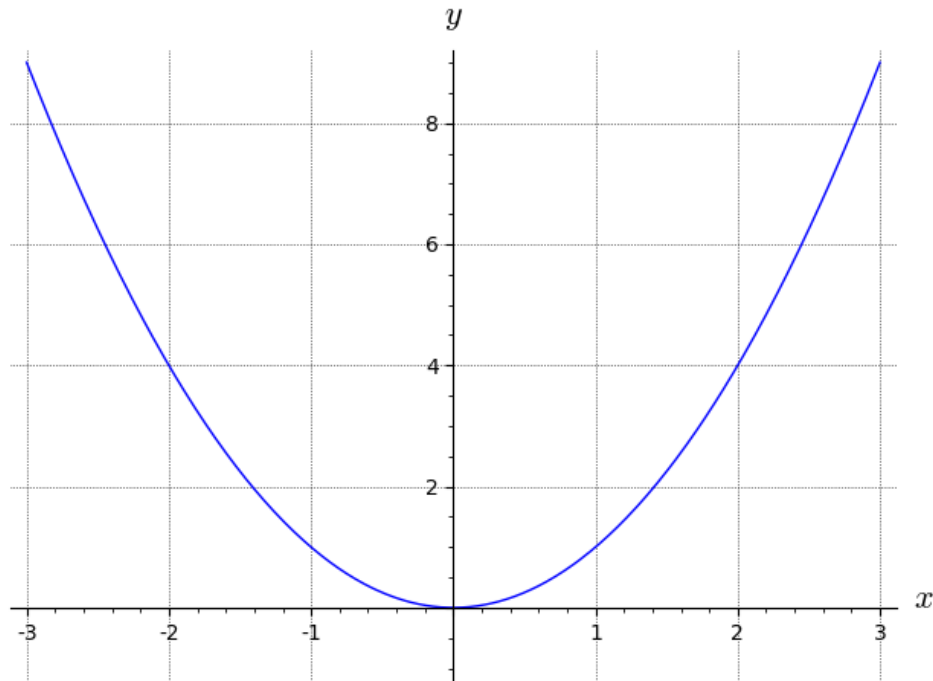


## Squaring Function

The squaring function has the form  $f(x) = x^2$ . The graph of  $f(x) = x^2$  is a parabola that opens upward and has its vertex at the origin.



Properties of the squaring function  $f(x) = x^2$ :

- Domain: All real numbers,  $(-\infty, \infty)$
- Range: All non-negative real numbers,  $[0, \infty)$
- Symmetry:  $f$  is an even function. Its graph is symmetric about the  $y$ -axis.
- Increasing/Decreasing:
  - $f$  is decreasing on  $(-\infty, 0)$ .
  - $f$  is increasing on  $(0, \infty)$ .
- Extreme values: The minimum value is  $y = 0$  at  $x = 0$ .
- Interesting features:
  - The graph is a smooth U-shaped curve called a *parabola*.
  - The graph opens upward and has its vertex (turning point) at  $(0, 0)$ .