

Finding the Range and Domain

We know that the domain for any quadratic function is all real numbers, so that won't be a problem. The difficulty can arise from finding the range of the function. To find the range of a quadratic function, we need to know how it opens, and the y value of the vertex. As it was discussed earlier, the y value of the vertex is the maximum or minimum value of a parabola, depending on how it opens; so it is the absolute highest or lowest point on the graph of the function.

The following is true for a quadratic function in standard form $y = a(x-h)^2 + k$.

If $a > 0$, the range is $[k, \infty)$.

If $a < 0$, the range is $(-\infty, k]$.