**Cost Function**

We can measure the accuracy of our hypothesis function by using a **cost function**. This takes an average difference (actually a fancier version of an average) of all the results of the hypothesis with inputs from *x*'s and the actual output *y*'s.



To break it apart, it is 1/2 x¯ where x¯ is the mean of the squares of *hθ*(*xi*) − *yi* , or the difference between the predicted value and the actual value.

This function is otherwise called the "Squared error function", or "Mean squared error". The mean is halved 1/2 as a convenience for the computation of the gradient descent, as the derivative term of the square function will cancel out the 1/2 term. The following image summarizes what the cost function does:

