Newton-Raphson method

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Newton-Raphson method

- We are now going to use the Newton-Raphson method to find for the square root of points between 0 and 20
- The function is $y = \sqrt{x}$, but remember that NR is a method to find the zeroes of a function

- We have to re-write our problem as: $y^2 - x = 0$

- So our goal is to find the zeros of the function

  $f(y) = y^2 - x$ for a given x

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  $f(y) = y^2 - x$ for a given x
- Task: calculate and print on a grid of 100 points between 0.2 and 20, with the built-in function sqrt(x) and with NR
- Again, we are just focusing on the qualitative features
- Remember the maths: for $f(y) = y^2 - x$, $f'(y) = 2y$

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- Start with 4 iterations, the starting point might be set to x

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- Start with 4 iterations
- Now increase the number of iterations one by one. How many iterations are necessary to reproduce the square root with a precision to 10^{-14}?