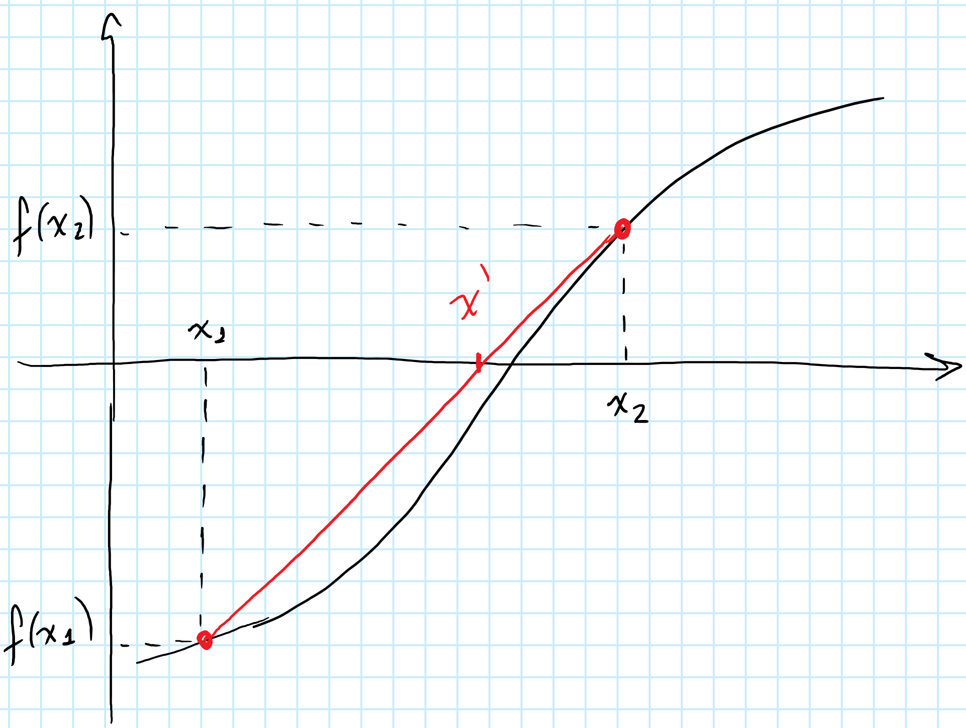
Method of False Position (Regula Falsi)

It converges faster than the Bisection method

Instead of finding the midpoint as in the Bisection Method, the Regula-Falsi method finds x' by taking the straight line joining the points $(x_1, f(x_1))$ and $(x_2, f(x_2))$ and selecting the point that intersects the x-axis.



To find x', we find the slope of the line joining $(x_1, f(x_1))$ and $(x_2, f(x_2))$ and do the slope joining $(x', 0)$ and $(x_2, f(x_2))$, which is the same slope.

Let us call $m =$ slope

$$m = \frac{f(x_2) - f(x_1)}{x_2 - x_1} \quad \text{and} \quad m = \frac{f(x_2) - 0}{x_2 - x'}$$

$=$

$$\big(f(x_2) - f(x_1)\big)\, x_2 - \big(f(x_2) - f(x_1)\big)\, x' = f(x_2)\, (x_2 - x_1)$$

$$\boxed{x' = x_2 - \frac{f(x_2)\, (x_2 - x_1)}{f(x_2) - f(x_1)}}$$

Apart from this, the method is equivalent to the bisection method.