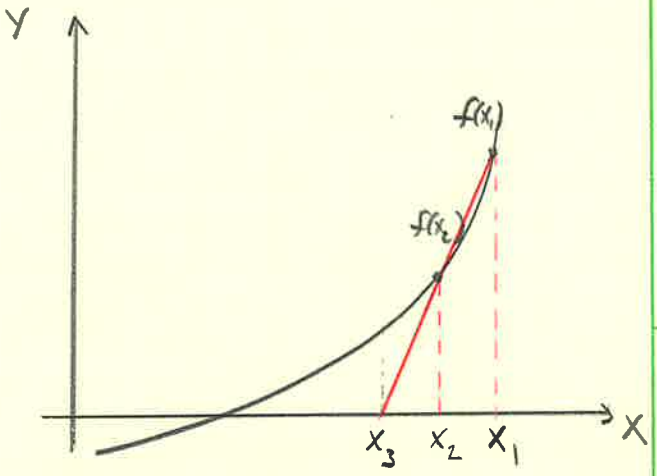
Secant Method

- open method
- Find numerical solution to $f(x)=0$
- No requirement that $f'(x)$ be available.
- Uses last two estimates to form new estimate.



Take Newton's Method & replace $f'(x_i)$ w/ first-order numerical approximation.

$$f'(x_i) \approx \frac{f(x_{i-1}) - f(x_i)}{x_{i-1} - x_i}$$

So the iteration formula becomes:

$$x_{i+1} = x_i - \frac{f(x_i)}{\left(\frac{f(x_{i-1}) - f(x_i)}{x_{i-1} - x_i}\right)}$$

$$= x_i - \frac{f(x_i)(x_{i-1} - x_i)}{f(x_{i-1}) - f(x_i)}$$