Newton's Method

Goal $\to$ Find r st $f(r) = 0$

x_0

__Idea__   Approximate $f(x)$ by linearization at x_k to obtain x_{k+1}

— Basically you draw a tangent at x_k & look for the intercept with the x axis $\to x_{k+1}$

$f(x)$

$$\frac{f(x_k)}{x_k - x_{k+1}} = f'(x_k)$$

$$x_{k+1} = x_k - \frac{f(x_k)}{f'(x_k)}$$