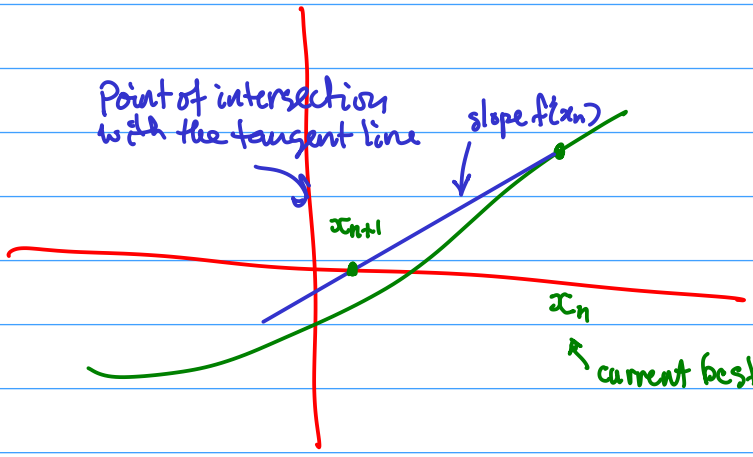
- A few things about Newtons Method.



Equation for the tangent line:

$$(y - y_n) = f'(x_n)(x - x_n)$$

← point slope form for line passing through $(x_n, f(x_n))$ with slope $f'(x_n)$

At the x-axis $y = 0$ so we have

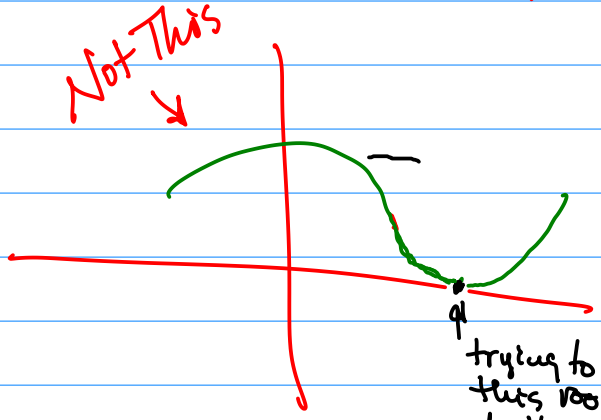
$$-y_n = f'(x_n)(x_{n+1} - x_n)$$

Solve for x_{n+1}

$$f'(x_n)x_{n+1} = -y_n + f'(x_n)x_n$$

divide by $f'(x_n)$ — note that $f'(x_n) = 0$ something bad happens...

What this means is the graph is not tangent to the x-axis.



trying to find this root don't use Newtons method. to solve $f(x) = 0$ instead solve $f'(x) = 0$ with Newtons method

$$f'(x_n)\,x_{n+1} = -y_n + f'(x_n)\,x_n$$

divide by $f'(x_n)$ — note that $f'(x_n) = 0$ something bad happens...

$$x_{n+1} = x_n - \frac{y_n}{f'(x_n)} = x_n - \frac{f(x_n)}{f'(x_n)}$$

Newton's Method

$$\varphi(x) = x - \frac{f(x)}{f'(x)}$$

then $x_2 = \varphi(x_1)$

$x_3 = \varphi(x_2)$

$\vdots$

$x_{n+1} = \varphi(x_n)$ Hope in the limit that $x_n \to$ the answer.