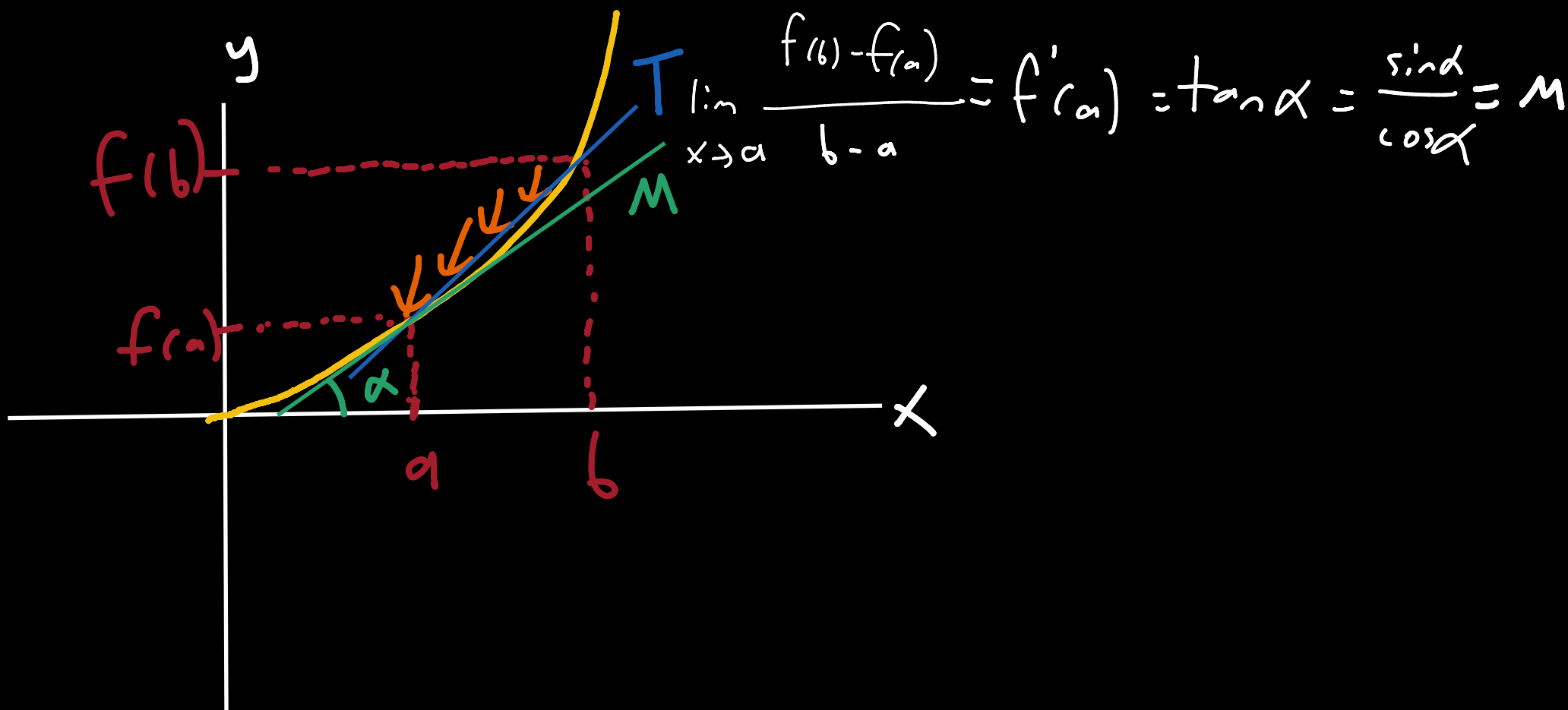


# Derivative

In T line when we're getting closer to point (a, f(a)) from point (b, f(b)), we realise that we're becoming similar to tangent of point (a, f(a)). That's why derivative of f(a) is =



$$b = a + h \quad \lim_{a+h \rightarrow a} \frac{f(a+h) - f(a)}{a+h - a} = \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$$

Why h goes to 0 ? Because h is the difference between a and a+h, if a+h goes to a this means that h is going to 0

$$\lim_{x \rightarrow 5} \frac{f(x) - f(5)}{x - 5} = f'(5) \quad \lim_{h \rightarrow 0} \frac{f(0+h) - f(0)}{h} = f'(0)$$

$$f(x) = x^2 \quad f'(3) = \frac{f(x) - f(3)}{x - 3} = \frac{x^2 - 9}{x - 3} = \frac{(x-3)(x+3)}{x-3} = 6$$