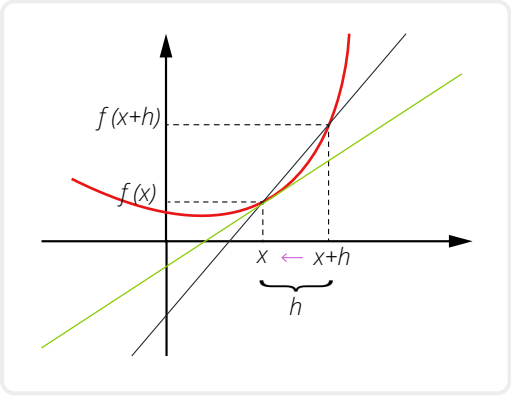
BASICS OF DERIVATIVES



First principles

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

Derivative
Gradient
Gradient of the tangent
Rate of change

FIND THE DERIVATIVE USING FIRST PRINCIPLES

- use the formula from above ⟶ f (x) is given, substitute into the formula
  ⟶ f (x + h) means f ∘ (x + h)

FIND THE DERIVATIVE USING THE RULES

- $(k\, f(x))' = k\, f'(x)$ ⟶ differentiate f (x) and multiply it by k
- $(f(x) + g(x))' = f'(x) + g'(x)$ ⟶ differentiate f (x) and g (x) seperately, then add them together
- the derivatives of standard functions are in the formula booklet!