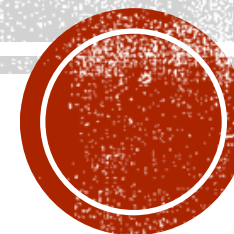
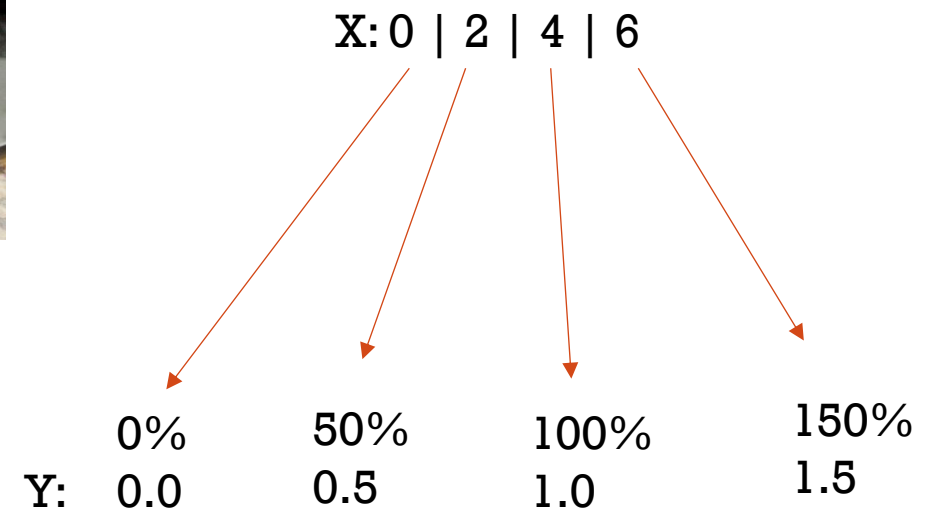
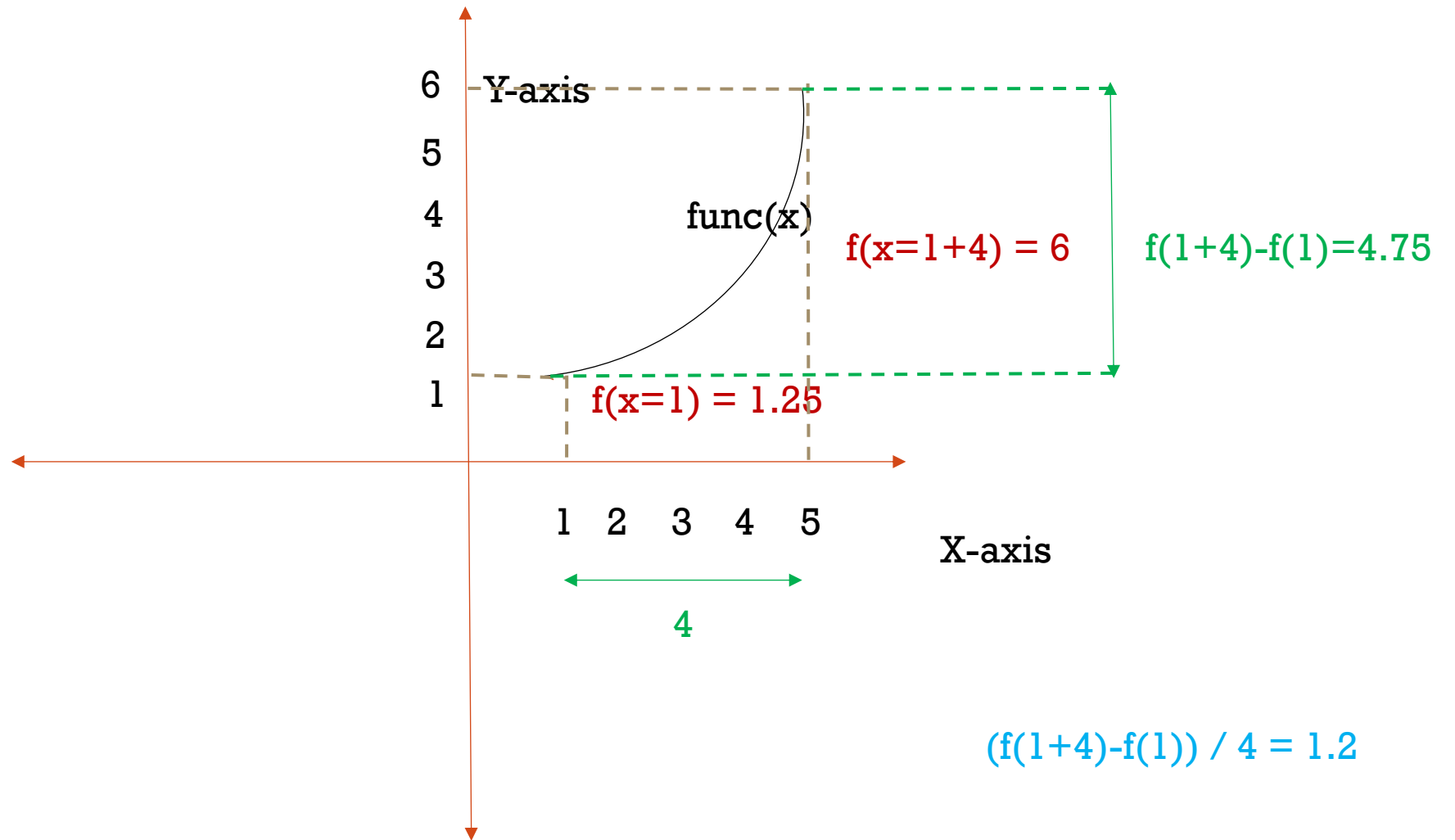


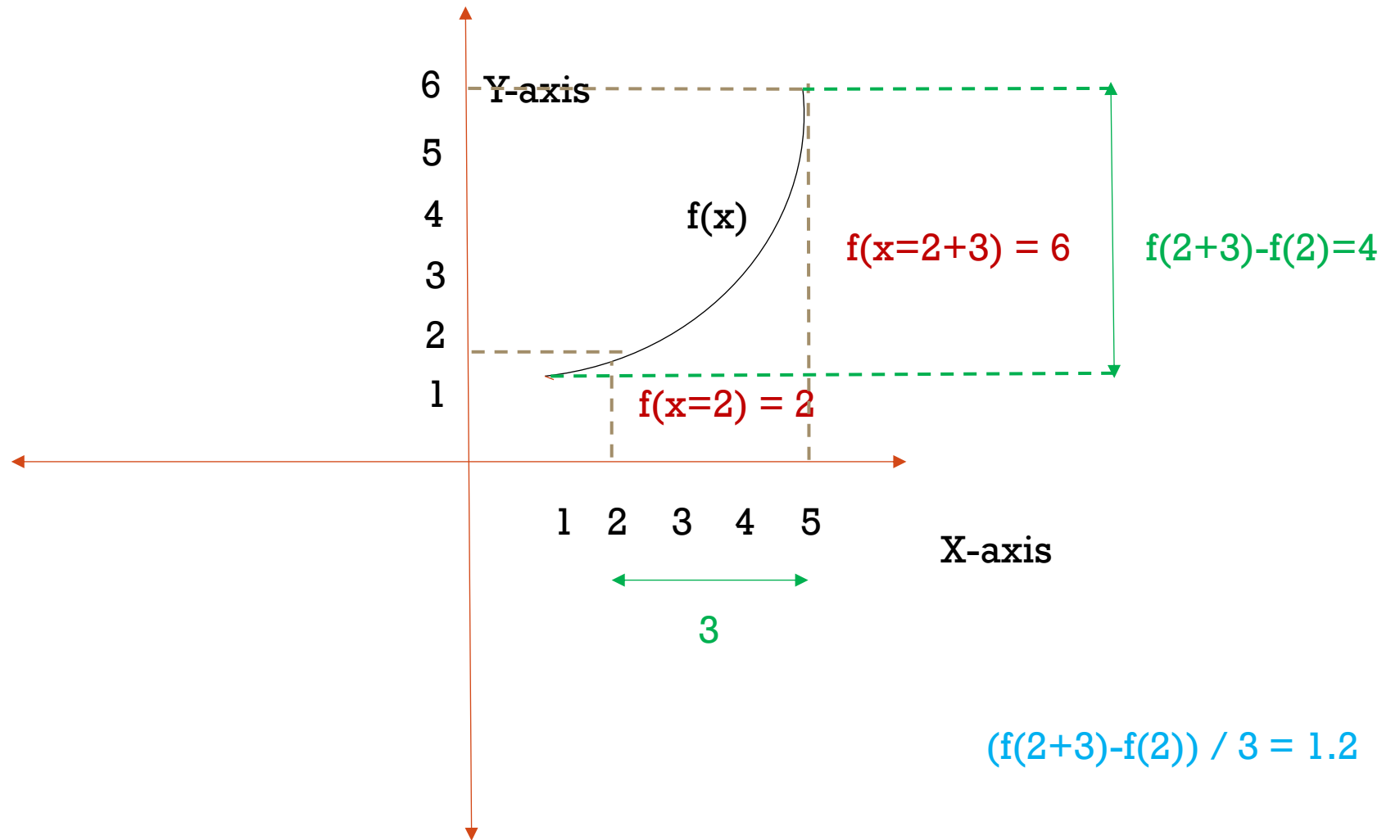
بسم الله الرحمن الرحيم

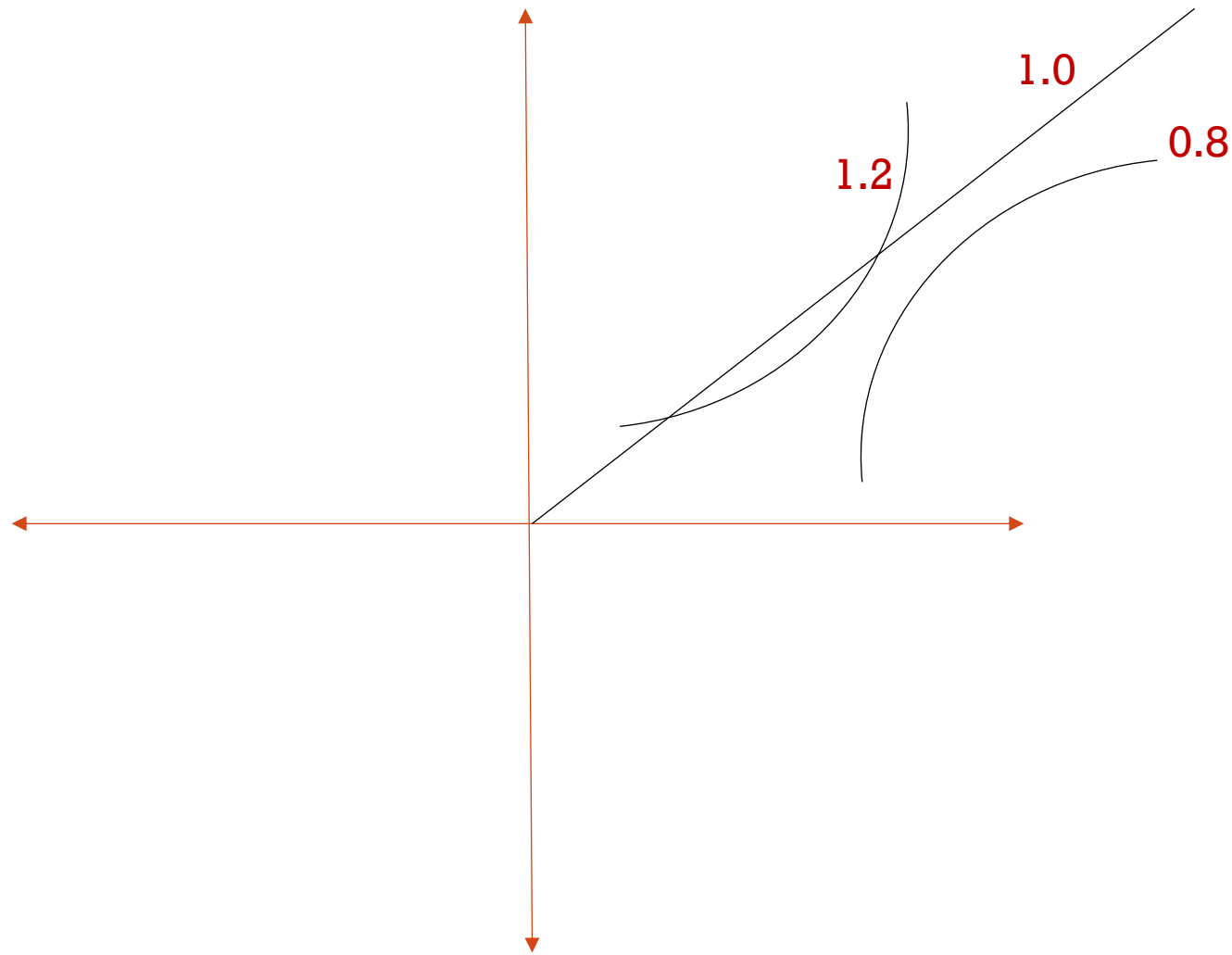
DERIVATIVE | SLOPE | GRADIENT





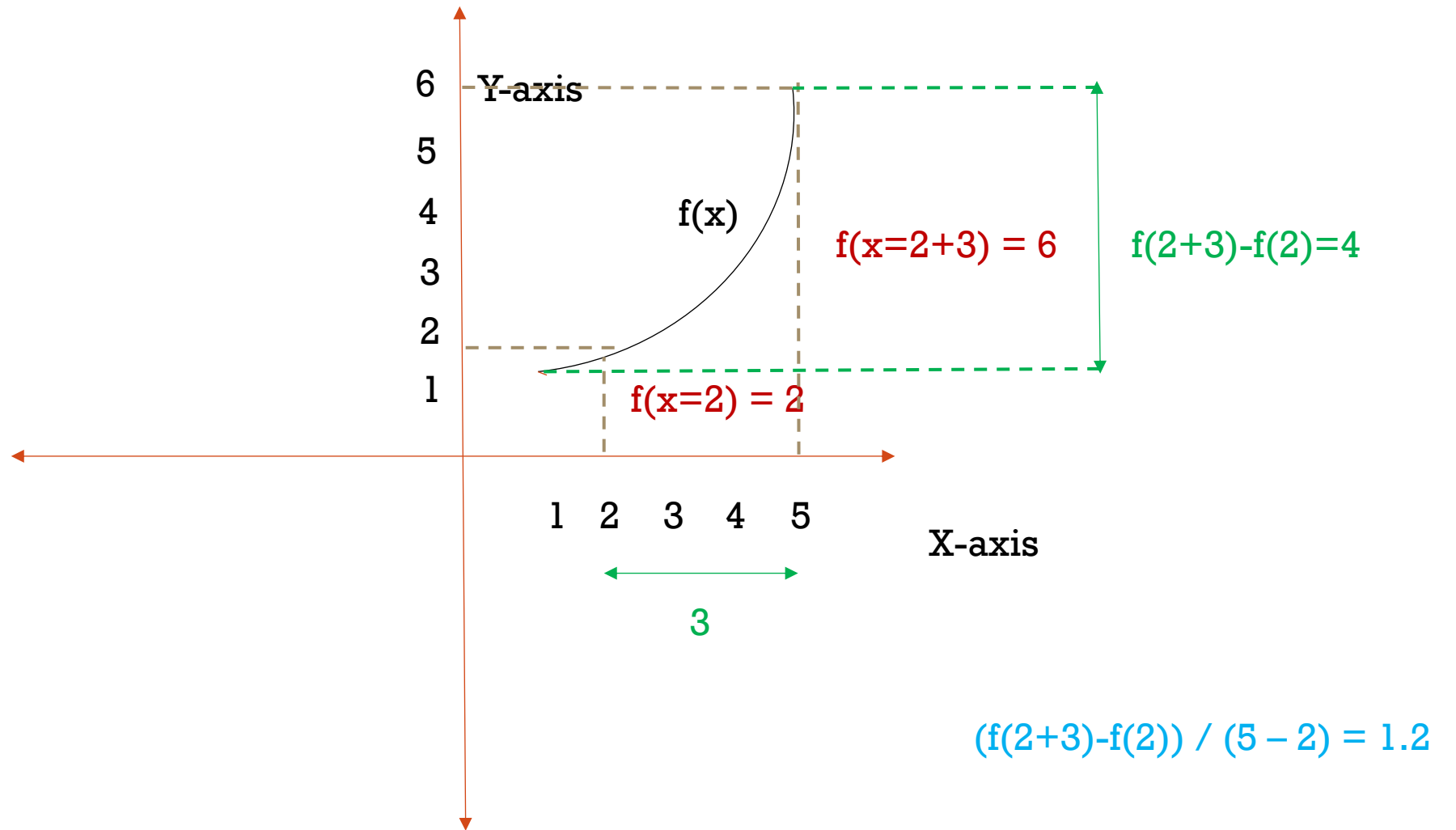






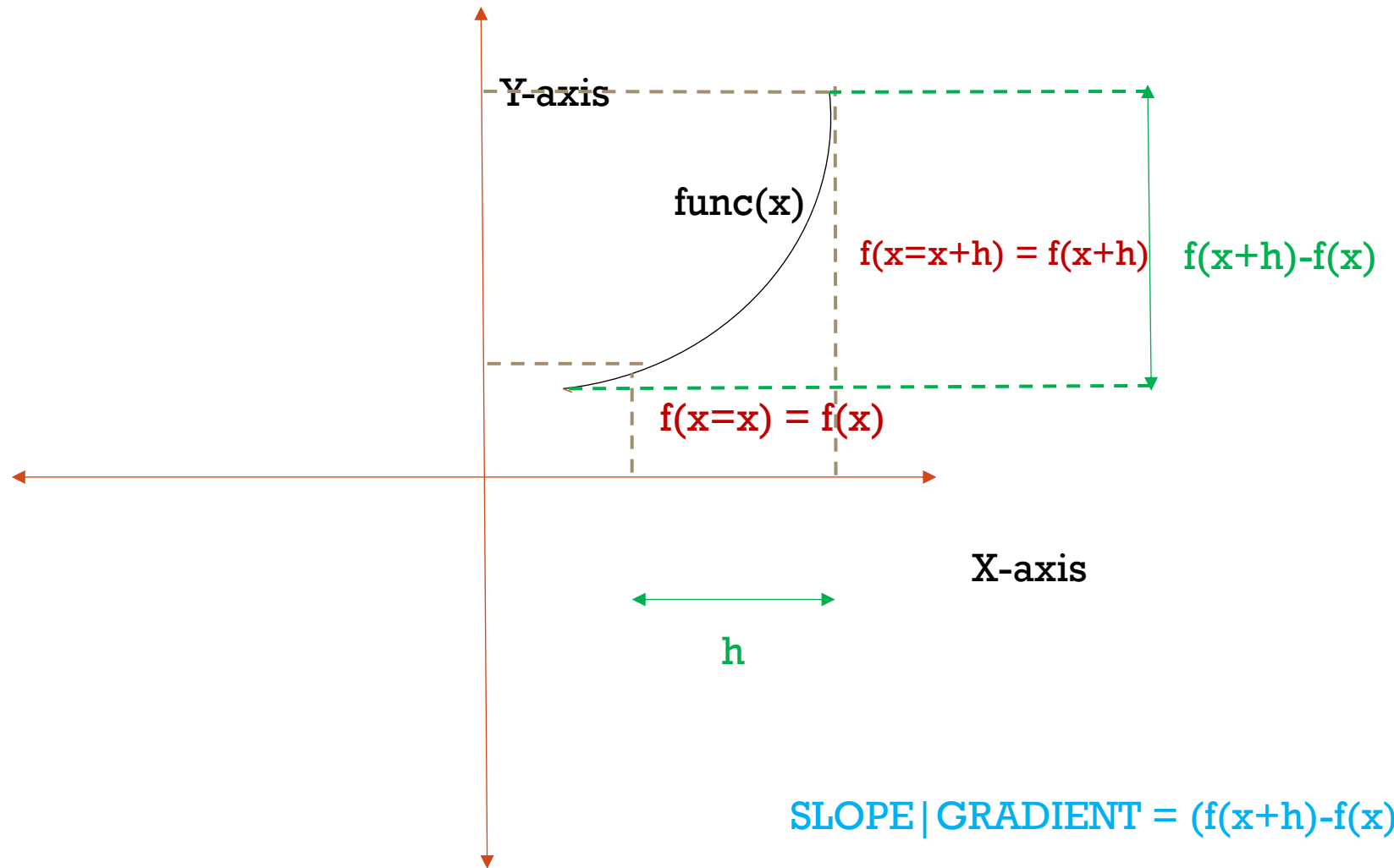
Derivative | Slope | Gradient





LET'S GENERALIZE





GRADIENT

- If we changed the function with some 'h', how will the output change

$$\frac{f(x + h) - f(x)}{h}$$



$$f(x) = 2 * x + 4$$

$$\frac{f(x + h) - f(x)}{h}$$

$$f(x+h) = 2 * (x+h) + 4$$

$$(f(x+h) - f(x)) / h$$

$$(2*(x+h) + 4 - (2*x+4)) / h$$

$$(\cancel{2*x} + 2*h + 4 - \cancel{2*x} - 4) / h$$

$$df/dx = 2*h / h = 2$$

Differentiating f with respect to x



$$f(a, b, c) = a * b + c$$

$$\frac{f(x + h) - f(x)}{h}$$

$$f(a+h, b, c) = (a+h) * b + c$$

$$(f(a+h, b, c) - f(a, b, c)) / h$$

$$((a+h) * b + c - (a*b + c)) / h$$

$$(\cancel{a*b} + h*b + c - \cancel{a*b} - c) / h$$

$$df/da = h*b / h = b$$

Differentiating f with respect to a



NEXT... Backpropagation

