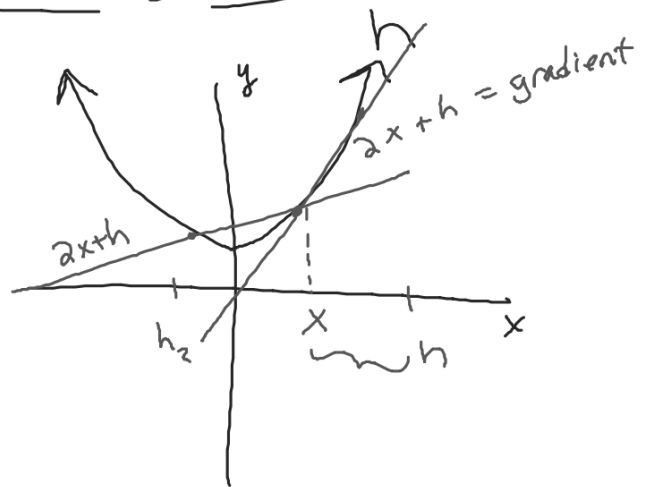


Ex WRITE AN EXPRESSION FOR THE GRADIENT
OF A SECANT LINE FOR $f(x) = x^2 + 1$
SIMPLIFY YOUR EXPRESSION.

$$\frac{f(x+h) - f(x)}{h} = \frac{(x+h)^2 + 1 - x^2 + 1}{h} = \frac{x^2 + 2hx + h^2 + 1 - x^2 - 1}{h}$$
$$= 2x + h$$



THE DERIVATIVE OF A FUNCTION IS THE LIMIT AS h APPROACHES 0

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}; \text{ provided the limit exists}$$

"f prime of x"

$\frac{dx}{dy}$ "the derivative of x with respect to y"

$f'(x)$ represents the slope of the tangent line to the function $f(x)$ at any x

* $f'(x) = 0$ at minimums and maximums

