15-3 Differentiation

Definition of Derivative

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

Find the derivative of $f(x) = x4$

There is an easier way to find derivatives!!!!

The derivative of a <u>CONSTANT FUNCTION</u>, f (x) = c, is ZERO

The derivatives of xn for n = 1,2,3,4,5 ...

f (x)	*x*	*x2*	*x3*	*x4*	*x5*
f '(x)					

Derivative f (x) = x n

If f (x) = xn (n ∈ N), then *f '(x) = n x n-1*

Example

f (x) = x 7, find $f'(x)$

Derivatives of Sums

The derivative of the sum of a finite number of differentiable functions is the sum of their derivatives

Examples

$f(x) = x2 - 5x + 2$, find $f'(x)$ and $f'(-1)$

$f(x) = (x2-5)2$, find $f'(x)$ and $f'(2)$