Exponential Functions

Recall: An exponential function is a function of the form:

$$f(x) = f_o a^x$$

where $f_o = f(0)$

Constant relative change for $\Delta x = 1$

That is, as x increases by 1, $f(x)$ gets a times bigger.

$\frac{d}{dx}(f_o a^x) =$

$$\frac{d}{dx}(a^x)$$

Try: $a = 2$

$f(x) = 2^x$

x	$f'(x)$

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

Example: $f(x) = 2^x$

Find $f'(0)$

$\frac{f(0+\Delta x)-f(0)}{\Delta x}$

Δx	Approx of $f\,'(0)$

Find $f'(2)$

$\frac{f(2+\Delta x)-f(2)}{\Delta x}$

Δx	Approx of $f\,'(2)$

$f(x) = 2^x$

$f'(x) =$

In general:

$$\frac{d}{dx}(a^x) =$$