Calculus Reference Sheet C: Introducing Definite Integrals

Limits			
$\lim_{x\to c}[f(x) \pm g(x)] = \lim_{x\to c} f(x) \pm \lim_{x\to c} g(x)$		$\lim_{x\to c}[f(x) \times g(x)] = \lim_{x\to c} f(x) \times \lim_{x\to c} g(x)$	
Derivatives			
Rules			
Constant	$\frac{d}{dx}[c] = 0$	Single variable	$\frac{d}{dx}[ax] = a$
Sum and difference	$\frac{d}{dx}[f(x) \pm g(x)] = f'(x) \pm g'(x)$	Power	$\frac{d}{dx}[x^n] = n \times x^{n-1}$ $\frac{d}{dx}[g(x)^n] = n(g(x))^{n-1} \times g'(x)$
Product	$\frac{d}{dx}[f(x) \times g(x)] = f(x) \times g'(x) + g(x) \times f'(x)$	Quotient	$\frac{d}{dx}\left[\frac{f(x)}{g(x)}\right] = \frac{g(x)f'(x) - f(x)g'(x)}{[g(x)]^2}$, $g'(x) \neq 0$
Chain	$f' \circ g(x) = f'(g(x)) = f'\big(g(x)\big) \times g'(x)$	Exponential	$\frac{d}{dx}\left[e^{g(x)}\right] = g'(x) \times e^{g(x)}$
Integrals			
Definite			
Definition		$\int_a^b f(x)dx = \lim_{n\to\infty} \sum_{i=1}^{n} f(x_i)\Delta x$	
Rules			
Constant	$\int_a^a f(x)dx = 0$	Single variable	$\int_a^b cdx = cx$
Sum and difference	$\int_a^b [f(x) \pm g(x)] = \int_a^b f(x)dx \pm \int_a^b g(x)dx$	Additive	$\int_b^a f(x)dx = -\int_a^b f(x)dx$
Power	$\int_a^b x^n dx = \frac{x^{n+1}}{n+1}$, $n \neq -1$	Exponential	$\int_a^b c^x dx = \frac{c^x}{\ln c}$