

# CALCULUS

## **Sum or Difference Rule**

If  $f(x) = u(x) \pm v(x)$ , then  $f'(x) = u'(x) \pm v'(x)$

## **Product Rule**

If  $f(x) = u(x) * v(x)$ , then  $f'(x) = u(x) * v'(x) + v(x) * u'(x)$

## **Quotient Rule**

If  $f(x) = \frac{u(x)}{v(x)}$ , and  $v(x) \neq 0$ , then  $f'(x) = \frac{v(x) * u'(x) - u(x) * v'(x)}{[v(x)]^2}$

## **Exponential Rule**

$$\frac{d}{dx} [a^{g(x)}] = (\ln a) a^{g(x)} g'(x)$$

$$\frac{d}{dx} [e^{g(x)}] = e^{g(x)} g'(x)$$

## **Logarithmic Rule**

$$\frac{d}{dx} [\log_a |g(x)|] = \frac{1}{\ln a} * \frac{g'(x)}{g(x)} \quad \text{and} \quad \frac{d}{dx} [\ln |g(x)|] = \frac{g'(x)}{g(x)}$$