

1. If $y = g(u)$ and $u = f(x)$, then

$$\frac{d}{dx}(y) = \frac{d}{du}(y) \cdot \frac{d}{dx}(u)$$

2. Let $f(x)$ and $g(x)$ be functions. Then

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

3. General power rule: Let a be any real number. Then

$$\frac{d}{dx}([f(x)]^n) = n[f(x)]^{n-1} \frac{d}{dx}(f(x))$$

4. Let $f(x)$ be a function. Then

$$\frac{d}{dx}(e^{f(x)}) = e^{f(x)} f'(x)$$

5. Let $f(x)$ be a function and a a positive number. Then

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

6. Let $f(x)$ be a positive function. Then

$$\frac{d}{dx}(\ln |f(x)|) = \frac{f'(x)}{f(x)}$$

7. Let $f(x)$ be a function. Then

$$\frac{d}{dx}(\log_a |f(x)|) = \frac{f'(x)}{f(x) \ln a}$$