

Chain Rule: If $F(x) = f(g(x))$, then $F'(x) = f'(g(x))g'(x)$

or If $y = f(u)$ and $u = g(x)$, then $\frac{dy}{dx} = \frac{dy}{du} \cdot \frac{du}{dx}$

Examples:

1. $y = (2x^3 + 5)^4$

2. $y = \sin(\cot x)$

3. $f(x) = \frac{1}{\sqrt[3]{x^2-1}}$

4. $f(t) = t \sin(\pi t)$

5. $g(x) = e^{x^2-x}$

6. $s(t) = \sqrt{\frac{1+\sin t}{1+\cos t}}$