

① LT8

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a) Find $g'(t)$ given $g(t) = \sin(e^t + 1)$

Inner $e^t + 1 \rightarrow e^t$
Outer $\sin(e^t + 1) \rightarrow \cos(e^t + 1)$

$$g'(t) = (e^t) \cdot (\cos(e^t + 1))$$

b) If $s(x) = e^{x^2 + 1}$, find $s'(x)$.

$$s'(x) = (2x) \cdot (e^{x^2 + 1})$$

Inner $x^2 + 1 \rightarrow 2x$
Outer $e^{x^2 + 1} \rightarrow e^{x^2 + 1}$

c) Find the derivative of $h(x) = \ln(x^2 + 1)$.

$$h'(x) = (2x) \cdot \left(\frac{1}{x^2 + 1}\right)$$

Inner $x^2 + 1 \rightarrow 2x$
Outer $\ln(x^2 + 1)$

d) If $f(x) = (x^3 - 5x)^{87}$, find $f'(x)$.

$$f'(x) = (3x^2 - 5) \cdot 87(x^3 - 5x)^{86}$$

Inner $x^3 - 5x \rightarrow 3x^2 - 5$
Outer $(x^3 - 5x)^{87} \rightarrow 87(x^3 - 5x)^{86}$