Example

Find \( f'(t) \) if \( f(t) = 8 \sec(3 \sec(2t)) \).

Solution: The derivative requires two applications of the Chain Rule. The rule is first used to find

\[
f'(t) = 8 \sec(3 \sec(2t)) \tan(3 \sec(2t)) \cdot \frac{d}{dt} [3 \sec(2t)],
\]

and the Chain Rule must be used again to find the last derivative. That is,

\[
f'(t) = 8 \sec(3 \sec(2t)) \tan(3 \sec(2t)) \cdot [3 \sec(2t) \tan(2t) \cdot \frac{d}{dt}(2t)]
\]
\[= 8 \sec(3 \sec(2t)) \tan(3 \sec(2t)) \cdot [3 \sec(2t) \tan(2t) \cdot 2]
\]
\[= 48 \sec(3 \sec(2t)) \tan(3 \sec(2t)) \sec(2t) \tan(2t).
\]