

## Indefinite integral example

Calculate indefinite integral of function below

$$\int 3^{5 \cdot x} \cdot dx$$

$$\int 3^{5 \cdot x} \cdot dx = \left\{ \begin{array}{l} 5 \cdot x = t \\ 5 \cdot dx = dt \\ dx = \frac{dt}{5} \end{array} \right\}$$

$$\int 3^t \cdot \frac{dt}{5}$$

$$\frac{1}{5} \cdot \int 3^t \cdot dt$$

$$\frac{1}{5} \cdot \frac{3^t}{\ln 3} + C$$

$$\frac{1}{5} \cdot \frac{3^{5 \cdot x}}{\ln 3} + C$$

We will check correctness of our calculation by calculating function's derivative

$$u(x) = \frac{1}{5} \cdot \frac{3^{5 \cdot x}}{\ln 3} + C$$

$$\frac{d}{dx} u(x) = \frac{\frac{1}{5} \cdot 3^{5 \cdot x} \cdot \ln 3}{\ln 3} \cdot 5$$

$$\frac{d}{dx} u(x) = 3^{5 \cdot x} \cdot dx$$