## Integrály a derivace

| | | |
|---|---|---|
| $y = \mathrm{e}^t$ | $y' = \mathrm{e}^t$ | $\int \mathrm{e}^t \,\mathrm{d}t = \mathrm{e}^t + c$ |
| $y = t$ | $y' = 1$ | $\int 1 \,\mathrm{d}t = t + c$ |
| $y = t^2$ | $y' = 2t$ | $\int 2t \,\mathrm{d}t = t^2 + c$ |
| $y = t^n$ | $y' = nt^{n-1}$ | $\int nt^{n-1} \,\mathrm{d}t = t^n + c$ |
| $y = \sin t$ | $y' = \cos t$ | $\int \cos t \,\mathrm{d}t = \sin t + c$ |
| $y = \cos t$ | $y' = -\sin t$ | $\int (-\sin t) \,\mathrm{d}t = \cos t + c$ |

## Derivace složené funkce

$$
\begin{aligned}
y &= \sin 10t \\
u &= 10t \\
u' &= 10 \\
y &= \sin u \\
y' &= u' \cos u \\
y' &= 10 \cos 10t
\end{aligned}
$$

$$
\begin{aligned}
y &= \cos 10t \\
u &= 10t \\
u' &= 10 \\
y &= \cos u \\
y' &= (-\sin u)u' \\
y' &= -10 \cos 10t
\end{aligned}
$$

$$
\begin{aligned}
y &= \mathrm{e}^{10t} \\
u &= 10t \\
u' &= 10 \\
y &= \mathrm{e}^u \\
y' &= \mathrm{e}^u u' \\
y' &= 10\mathrm{e}^{10t}
\end{aligned}
$$

## Integrál složené funkce

$$
\begin{aligned}
y &= \sin 10t \\
\int y \,\mathrm{d}t &= \int \sin 10t \,\mathrm{d}t \\
u &= 10t \\
u' &= \frac{\mathrm{d}u}{\mathrm{d}t} = 10 \\
\mathrm{d}t &= \frac{\mathrm{d}u}{10} \\
\int \sin u \,\mathrm{d}t &= \int \sin u \frac{\mathrm{d}u}{10} \\
\frac{1}{10} \int \sin u \,\mathrm{d}u &= -\frac{1}{10} \cos u \\
\int \sin 10t \,\mathrm{d}t &= -\frac{1}{10} \cos 10t + c
\end{aligned}
$$

$$
\begin{aligned}
y &= \mathrm{e}^{-t} \\
\int y \,\mathrm{d}t &= \int \mathrm{e}^{-t} \,\mathrm{d}t \\
u &= -t \\
u' &= -1 \\
\frac{\mathrm{d}u}{\mathrm{d}t} &= -1 \\
\mathrm{d}t &= -\mathrm{d}u \\
\int \mathrm{e}^{u} \,\mathrm{d}t &= -\int \mathrm{e}^{u} \,\mathrm{d}u \\
\int \mathrm{e}^{-t} \,\mathrm{d}t &= -\mathrm{e}^{-t} + c
\end{aligned}
$$