$(x^{-n})' = ?$ ✓

$(\sqrt[n]{x^m})' = ?$ ✓

$\left(\frac{1}{\sqrt[n]{x^n}}\right)' = ?$

$(x^g)' = ?$ $\quad g \cdot x^{g-1}$ známe pro $g = n \in \mathbb{N}$

$g = \frac{1}{n}$

$g = -1$

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

$y = x^n$

$(y^{-1})' = \frac{-1}{y^2}$

$$= \frac{-1}{x^{2n}} \cdot n \cdot x^{n-1} =$$

$$= -n\, x^{-2n+n-1} =$$

$$= -n\, x^{-n-1}$$

(V2)

$$\left(\sqrt[n]{x^m}\right)' = \left(\left(x^m\right)^{\frac{1}{n}}\right)' = \frac{1}{n}\left(x^m\right)^{\frac{1}{n}-1} \cdot m\, x^{m-}$$

$$\left(y^{\frac{1}{n}}\right)' = \frac{1}{n}\, y^{\frac{1}{n}-1}$$

$$= \frac{m}{n} \times x^{m\left(\frac{1}{n}-1\right)+m-1} =$$

$$= \frac{m}{n} \times x^{\frac{m}{n}-m+m-1} =$$

$$= \frac{m}{n} \times x^{\frac{m}{n}-1}$$

$$\left(x^{\frac{m}{n}}\right)' = \frac{m}{n} \times x^{\frac{m}{n}-1}$$

$$\left(\frac{1}{\sqrt[n]{x^m}}\right)' = \left(\left(x^{\frac{m}{n}}\right)^{-1}\right)' =$$

$$(y^{-1})' = \frac{-1}{y^2}$$

$$= \frac{-1}{\left(x^{\frac{m}{n}}\right)^2} \cdot \frac{m}{n} x^{\frac{m}{n}-1} =$$

$$= -\frac{m}{n} \cdot x^{\frac{-2m}{n} + \frac{m}{n} - 1} =$$

$$-\frac{m}{n} * -1$$

$$= -\frac{m}{n} x$$

Závěr:

$$\left(x^{-\frac{m}{n}}\right)' = -\frac{m}{n} x^{-\frac{m}{n}-1}$$

$$(x^g)' = g x^{g-1}$$