

Exercise 1.4.10(g)

in the notes! ∇

It is just algebra with
the logarithm function.

$$\begin{aligned} \ln \left(\left(\frac{1}{|x|} \right)^{3/\ln|x|} \right) &= \\ &= \ln \left(|x|^{-3/\ln|x|} \right) \\ &= -\frac{3}{\ln|x|} \ln|x| \\ &= -3 \quad \forall x \in \mathbb{R} \setminus \{0\} \end{aligned}$$

Therefore

$$\left(\frac{1}{|x|}\right)^{3/\ln|x|} = e^{-3}$$

$$\forall x \in \mathbb{R} \setminus \{0\}$$

$$\lim_{x \rightarrow 0} e^{-3} = ? = e^{-3}$$

Should be easy to prove !!

To some extent this
is the same problem
as: $\overbrace{\text{DAP...}}$

as:

$$\lim_{x \rightarrow 0} \frac{|\text{sign}(x)|}{e^3} = e^3$$

Prove it! ∇