Problem 24: Number of Digits

Given two natural numbers x and k, compute the number of digits needed to represent x in base-k.

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\begin{aligned}
A &= \underset{x}{\mathbb{N}} \times \underset{k}{\mathbb{N}} \times \underset{d}{\mathbb{N}} \\
B &= \underset{x'}{\mathbb{N}} \times \underset{k'}{\mathbb{N}} \\
Q &= (x' = x) \wedge (k' = k) \\
R &= Q \wedge k^d < x \leq k^{d-1}
\end{aligned}
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