$$\lim_{x\to\infty}(x^{1/x})$$

Use an extension of l'Hôpital's rule to compute $\lim_{x\to\infty}(x^{1/x})$.

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$$\lim_{x\to\infty} x^{\frac{1}{x}}$$

$$= \lim_{x\to\infty} x^{x^{-1}}$$

$$= \lim_{x\to\infty} e^{x^{-1}\ln x}$$

$$= e^{0}$$

$$= 1$$

$$\lim_{x\to\infty} x^{-1}\ln x$$

$$= \lim_{x\to\infty} \frac{1/x}{1} \quad \text{(L'hospital)}$$

$$= 0$$